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ANNUAL TURF ISSUE

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For More Details Circle (113) on Reply Card

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The Cover

What better way is there to kick off the annual turf issue than by reporting the story behind a new commercial strain of grass — Pennstar Kentucky Bluegrass? That's the grass on the cover. The man is Dr. Joe Duich of Pennsylvania State University who has put 15 years of research effort into its development. The cover feature, beginning on page 8, describes the variety's characteristics. Summed up, Dr. Duich says it is "perhaps the best single all-around turfgrass variety available in the United States today."

WEEDS TREES and TURF is published monthly by The Harvest Publishing Company, subsidiary of Harcourt Brace Jovanovich, Inc. Executive, editorial headquarters: 9800 Detroit Ave., Cleveland, Ohio 44102.

Single Copy Price: 50 cents for current issue; all back issues 75 cents each. Foreign $1.00.

Subscription Rates: WEEDS TREES AND TURF is mailed free, within the U.S. and possessions and Canada, to qualified persons engaged in the vegetation care industry and related fields in controlled circulation categories. Non-qualified subscriptions in the U.S. are $7.00 per year; Canada and other countries, $10.00 per year. Controlled circulation postage paid at Fostoria, Ohio 44830.

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WEEDS TREES and TURF®

Volume 10, No. 1 **January, 1971**

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The Golden Rule as Applied to the Environment

BEFORE A FINGER IS LIFTED to change the environment . . . Let us require of *all* people who wish to change it, comparable scientific evidence in support of a need for change, comparable documentation of possible effects of the change—including expected benefits—as have been required of those who have made the environment what it is today.

It's a reasonable demand, we believe. Such an "environmental Golden Rule" would force proponents of change to consider the *total* environment. It would force an evaluation of the benefit-risk equation. We believe better solutions to our problems would result.

Such a Golden Rule adaptation would prevent an outcome described by sanitary engineering consultant John E. Kinney, speaking at the National Pest Control Association meeting recently. "Under the spell of the panicmonger," he said, "the citizenry could surrender all authority in decision making on the environment to those whose regulations would not permit a use and only then learn the surrender had actually jeopardized health, food, and pleasure and had not guaranteed protection."

"Protect the environment" has become an excuse for all sorts of crusades for glory and power, Kinney says. A characteristic of the self-interest crusader that distinguishes him from the real environmentalist, he believes, is the crusader's failure to complete the sentence.

"Protect the environment from what? Or for what? Or for whom? Or from whom?"

Normal human reaction to a major problem, Kinney continues, is first that of apathy, then overreaction, then a return to apathy.

The danger concerns the type of legislation that occurs during the overreaction period. Rarely is there an admission of error on the part of those who call for action or on the part of those who pass legislation, Kinney says. Instead, the finger of blame will be pointed in another direction and more legislation offered as the panacea.

"We have entered a new, in some respects, ominous, but perhaps necessary era in the consideration of pesticides in this country," said Bernard Lorant, a pesticide consultant and former vice-president of research and development for Velsicol Chemical Corporation. "I call it the legal era."

Explaining, as he addressed the Ohio Turfgrass Conference in December, "the new era is when scientific questions will be settled by formal, adversary proceedings in the courts of our land, or in quasi-judicial arenas.

"More frequently, questions of efficacy and safety for pesticides will be decided by lay judges. That the pendulum will swing too far on the ecology side, to the detriment of all, seems likely."

Your call to "jury duty" is clear and urgent. The National Agricultural Chemicals Association has a new pamphlet that will help prepare you for the role you must play in preserving and improving the environment in favor of man. The booklet is called "Sound Off" and describes how laws are made. It explains the procedural route bills follow on the way to becoming law. There is discussion of preparation and presentation of testimony, of witness selection, and on letter writing. (For copies, write NACA, 1155 Fifteenth St., N.W., Washington, D.C. 20005.)

Finally, though, it is you who use pesticides who must be the cross-examiner when "cases" arise in your area of influence. You must bring the questions in the open and must demand the answers that separate the self-interest crusaders from the real environmentalists.

You must demand answers in the same depth from those who would take away your tools as have been demanded of those who provide you the tools of your livelihood.

What wisdom there is in that rule . . . the Golden One!

Gene Ingalsbe

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The Story Behind

JOE DUICH and PENNSTAR

ATTRACTING WIDE attention among turf specialists is a promising new release of Penn State University called Pennstar Kentucky Bluegrass.

An improved variety with more than 15 years of testing behind it, Pennstar is reported to be outstanding for disease resistance and for its compatibility with other improved grasses in turf mixtures. It is not aggressive and will not crowd out other varieties. But neither will it allow itself to be crowded out by overly-aggressive varieties. With its ability to withstand low mowing, its resistance to disease and its ability to compete under lower fertility, Pennstar is able to hold its own against just about any competition.

Pennstar is unique in that its origins can be traced back directly to a commercial lot of Kentucky Bluegrass purchased in 1929 by Penn State University. It was a routine purchase at the time, and none of the participants had any inkling of what was to follow. They were far more interested in establishing a new project that had come to the school.

The year 1928 had been a particularly bad one for turfgrasses in the East. Many country clubs and home lawns were in terrible shape. The late turf pioneer Joseph Valentine, then superintendent of Ardmore Pennsylvania Merion Golf Club, led a delegation to the agricultural college situated in the center of Pennsylvania at State College. The group presented their turf problems to the president of the college and asked for the same sort of help the college was giving farmers in the prevention of disease and the development of improved varieties and management techniques for their crops.

The school agreed to initiate a turf project, and enthusiasm for it grew to such an extent that it has since become one of the most respected and productive programs of its kind in the United States.

At about this time, a young fellow destined to play an important part in the University's turf work was born in another part of the state. Joseph Duich, now professor of turfgrass science at Penn State, first became interested in turf management and turf problems at the age of 14. This was during the Second World War, when labor was scarce. The greenskeeper of the golf course where young Joe caddied during the summer asked him to help keep up the greens and fairways. The work fascinated Joe, and his interest grew as his experience grew. While studying landscape architecture at Penn State, he tried to get into turf management courses taught by the late great Dr. H. B. Musser. He was told that agronomic courses were limited to those attending the school of agriculture. This led to a decision that changed his life's direction and has had equally far-reaching effects in the development of turf management and the introduction of new turf varieties. He decided to change his major to agronomy. After graduation, he continued to work under Dr. Musser and ultimately took charge of the turf efforts at Penn State.

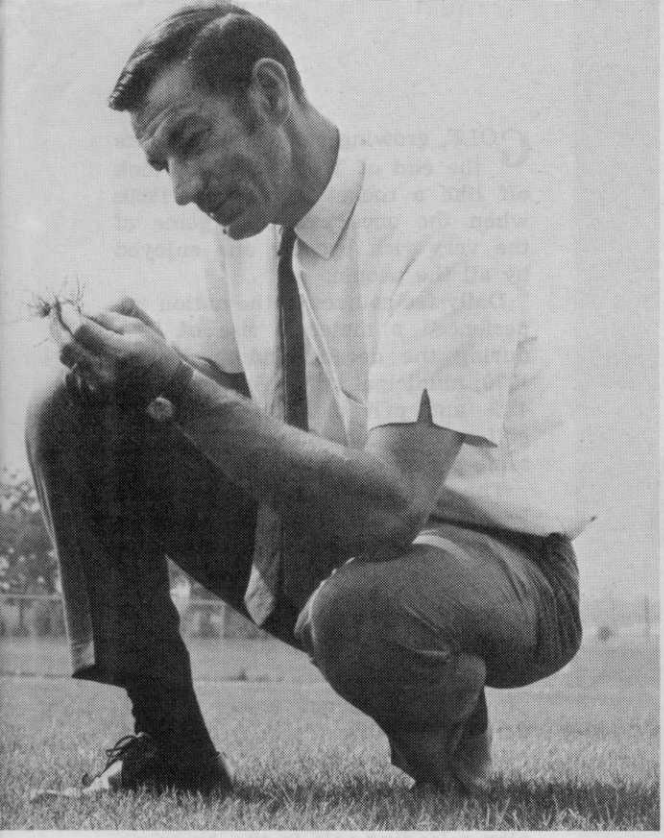
Dr. Duich is particularly interested in turf management and conducts a winter term course for professionals in the field — some of them numbered among the many golf course superintendents who learned their trade as Penn State students under Dr. Duich's tutelage.

Dr. Duich readily admits "My life is turf," yet for all his enthusiasm he is coolly detached in evaluating new varieties, mixtures and management techniques. He candidly says that the rapid development of interest in artificial turf simply represents "our failure" in properly educating people in the necessity of handling turf properly. He says, "Most people who work with turf, even those who know something about the varieties to use, have no idea of how to properly construct the physical base for a playing field that needs careful management."

Dr. Duich's work on Pennstar was directed toward the development of a variety with a "long haul" capability — a disease-resistant variety that is not overly aggressive nor temperamental in needs of fertility, mowing height or weather.

Pennstar tests indicate it fills the bill on all these counts. Pennstar performance has been tested since 1950 in a series of trials at Penn State (many of them still under way). In addition, turf specialists at other leading universities have made extensive tests of the variety under every type of condition.

Indications are that Pennstar is



Dr. Joseph Duich, professor of turfgrass science at Penn State, is the man responsible for the testing and introduction of Pennstar Kentucky Bluegrass. A nationally recognized expert in evaluating new varieties, mixtures and management techniques, Dr. Duich is assisted at Penn State by two full-time staff workers, two technicians, a plant pathologist specializing in turf, and graduate students working on specific projects.

highly resistant to all three of the most common diseases affecting Kentucky Bluegrasses:

—Stripe Smut *Ustilago striiformis)* A unique disease that spreads internally and goes from one tiller to another, Stripe Smut shreds individual leaves as the spores pop out. The disease sporulates in May or June, causing great damage.

Rust *(Puccinia spp)* Pennstar is highly resistant to rust, especially during the establishment period when bluegrasses are ordinarily most susceptible.

—Leaf Spot *(Helminthosporium vagans)* Pennstar is highly or very resistant to most varieties of leaf spot While it is true that most improved varieties of bluegrass demonstrate some resistance to this disease because of its frequency of occurrence (leaf spot is bad in four out of five years) Pennstar trials show significantly more *resistance* than some other varieties.

Pennstar is reported to establish well and resists fadeout under a wide variation in management. It is a turf-type bluegrass, referred to as low-growing or decumbent. With a leaf angle often close to 90° from vertical, it can tolerate a low mowing height and still retain a good leaf area. It will gradually replace common bluegrass under low mowing management.

An interesting characteristic of Pennstar is its ability to thrive year after year without producing any damaging quantities of thatch. Normally aggressive varieties can be expected to thatch up under good management practices, but plots of Pennstar torn up after eleven years reveal no excess thatch despite the fact that no dethatching had been done during the entire period.

Pennstar has shown the ability to withstand drought conditions to a greater degree than some other Kentucky Bluegrass varieties. It persists at moderate-to-low fertility levels and does not over-react to higher fertility. It has a pleasing medium bluegrass color that blends well with other varieties and does not show up as either extremely dark or noticeably light in mixtures.

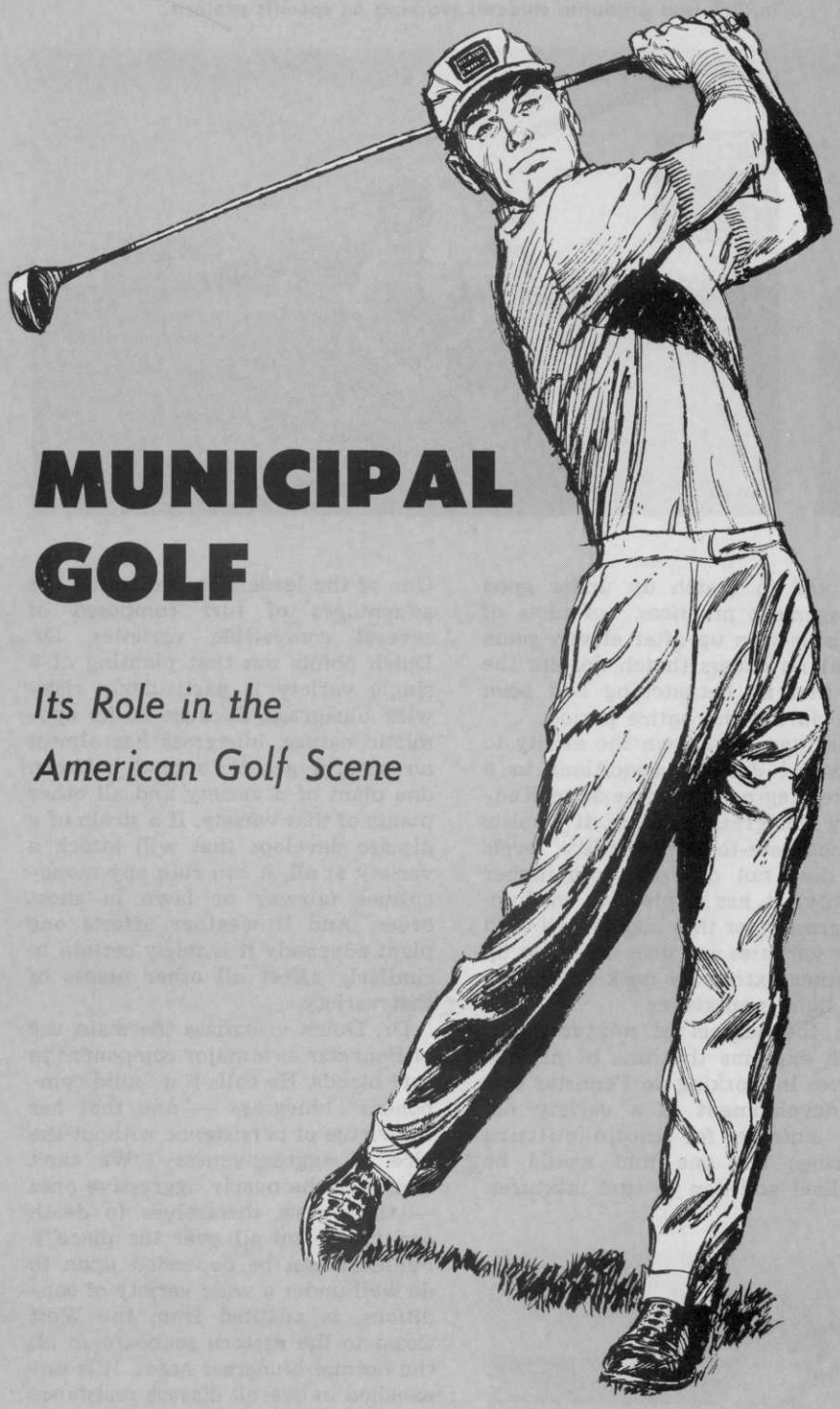
On the subject of mixtures, Dr. Duich explains that one of his objectives in working on Pennstar was the development of a variety not only suitable for mono-culture plantings but one that would be a valued addition to turf mixtures.

One of the leaders in promoting the advantages of turf composed of several compatible varieties, Dr. Duich points out that planting of a single variety is particularly risky with bluegrass. Because of its apomictic nature, bluegrass has almost no natural genetic spread between one plant of a variety and all other plants of that variety. If a strain of a disease develops that will attack a variety at all, it can ruin any monoculture fairway or lawn in short order. And if weather affects one plant adversely it is fairly certain to similarly affect all other plants of that variety.

Dr. Duich visualizes the main use of Pennstar as a major component in turf blends. He calls it a "solid component" bluegrass — one that has the virtue of persistence without the vice of aggressiveness ("We can't live with the overly aggressive ones — they grow themselves to death and thatch up all over the place"). Pennstar can be depended upon to do well under a wide variety of conditions, is adapted from the West Coast to the eastern seaboard in all the normal bluegrass areas. It is unexcelled in overall disease resistance and will not fade out when mowed short or given limited fertility.

In short, according to one independent turf researcher, "I would say it is perhaps the best single all-around turfgrass variety available in the United States today."

Dr. Duich has found a way to take his work home with him and really enjoy it.



MUNICIPAL GOLF

Its Role in the American Golf Scene

By HARRY C. ECKHOFF
Facility Development Consultant
National Golf Foundation

* This presentation by Mr. Eckhoff was made at the Ohio Parks and Recreation Association annual convention recently in Cincinnati. The golf outlook article was prepared additionally for WEEDS TREES and TURF.

GOLF, growing steadily ever since the end of World War II, took off like a rocket during the 1960s when the once exclusive game of the very rich became one enjoyed by all the people.

Daily fee courses in the nation experienced a meteoric rise of 85% during the decade ending Jan. 1, 1970; municipal operations increased 42% and private clubs 38%. New golf course openings during the same period averaged 354 a year.

The combination of increased leisure time, income and mobility has made recreation the fourth largest and fastest growing industry in the United States today. And golf has become the nation's fastest growing competitive outdoor sport. Alert American communities are providing more and better municipal golf facilities for their residents.

While municipal golf courses comprise only about 13% of the nation's 10,000-plus golfing facilities, they do play a leading role in the American golf scene. NGF's studies reveal that municipal courses (city, county or state operated) handle about 45% of the country's golf play.

This is believable when many cities report from 60,000 to 100,000-plus rounds played annually on each of their 18-hole layouts. A recent sampling survey shows an average of 53,194 rounds for the almost 100 facilities reporting. The sampling includes both large cities and small towns.

About 60% of the nation's 1300 municipal golf operations are located in 13 states. California leads with 122. Others high on the list are Texas, 102; Illinois, 82; New York, 78; and Indiana, 54. Minnesota, Ohio, Wisconsin and Florida each have 40 or more.

How do municipal golf courses operate? What are their policies on green fees, season rates, advance reservations, use of powered cars? And what special programs have some initiated that have proved popular and successful? Recent contact with some of the nation's outstanding municipal golf operations reveals some interesting trends.

Bethpage Park Golf Complex

Bethpage, located in the central part of Long Island about 40 miles east of New York City, is often referred to as the most complete municipal golf plant in the world. Operated by the Bethpage State Park Authority, it has five 18-hole regulation length golf courses all operating from the same clubhouse. Once you tee off, the next time you are back at the clubhouse is after

you have holed out your putt on the 18th green.

Says Eric Siefert, Park Superintendent, "In the last 10 years our five 18-hole courses averaged about 320,000 rounds a year—last year 340,000 rounds were played. Because of space limitations there are no plans for expansion."

Green fees for 18 holes at Bethpage are $2.50 weekdays; $3.75 weekends and holidays. Bethpage offers no season rates; has no reservation system nor does it have powered cars. Since the opening of its fifth course in 1958, the Bethpage golf operation has always paid its own way. Seven private clubs (four men's and three for women) have been organized that use Bethpage facilities for their golfing activities.

Los Angeles—171 Golf Holes

Los Angeles City presently operates 13 golf courses. These include five regulation 18-hole layouts, four regulation 9-hole and four par-3 courses—a total of 126 regulation length holes and 45 par-3 holes. Grand total—171 holes. During the past five years golf play has averaged more than one million rounds annually on those 13 facilities.

Daily green fees for 18 holes (fees are the same every day of the week) are $3; with reservations — $3.50. The charge for a replay (a second 18 the same day) is $1.50. Also offered is a monthly permit (not good on Saturdays, Suudays or holidays) —cost $6. Holders of this permit may play 18 holes of golf on weekdays for $2.

Says Ray Goates, City Golf Manager, "Powered golf cars are available to the public at the city's five 18-hole courses only. They are supplied and maintained by a private concession. A fleet of 195 cars is in use on the five courses and rental fees are $7 for 18 holes." According to Goates, a $9 million program to add 72 holes of golf from self-liquidating bonds is now being considered by the Los Angeles City Council.

Milwaukee County's 12 Courses

Like the City of Los Angeles, the Milwaukee County, Wisconsin, Park Commission also operates 171 holes of municipal golf. Facilities here include one 9-hole and six 18-hole regulation courses plus one 18- and four 9-hole par-3 layouts.

Milwaukee County offers no season rates; does have a reservation

HARRY ECKHOFF

system—charges 50¢ per player for reservations; has powered golf cars only at its new 18-hole, 6910 yard, J. C. Dretzka course. Rental charge is $6 for 18 holes.

Current adult green fees for 18 holes are $2 any day. Says William Felton, Jr., Milwaukee County Park Commission Education and Information Officer, "We are anticipating a raise in fees for 1971 which would bring an 18-hole adult permit to $3 and raise other rates accordingly." About 700,000 daily play permits are sold annually at the county's 12 golf courses.

Ohio Municipal Golf

As stated earlier, Ohio, with more than 40 municipal golf courses, is one of the 13 leading states contain-

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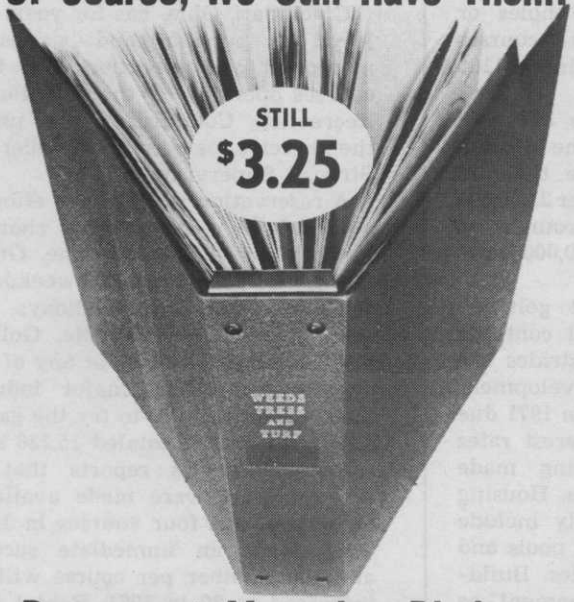

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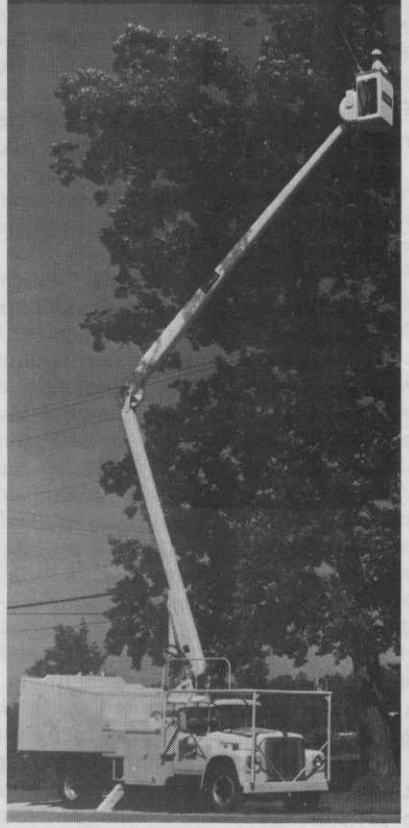

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GOLF OUTLOOK

By HARRY C. ECKHOFF

WITH 393 new golf courses or additions to existing facilities in some stage of construction at year's end, 1971 should be an excellent year for golf course development. NGF records reveal that 352 of the above mentioned courses are regulation length facilities; 41 are par-3 or executive type.

New regulation length courses in the under-construction category total 252; additions to regulation courses account for 100. For par-3s the figures are 28 and 13, respectively.

Leading states with new golf courses under construction are California, 23; Ohio, 22; Florida, 19; Michigan, 18; New York and Pennsylvania, 16; North Carolina and Texas, 15; Georgia, Tennessee and Washington, 14 each.

Despite the prolonged tight money situation, NGF reports that 314 regulation length facilities (213 new ones and 101 additions to existing courses) opened in 1970. About 42% of these new facilities were private operations, 46% semi-private or daily fee and 12% municipal.

Thirty-eight new par-3 operations (29 new courses and 9 additions) also were reported in play in 1970. Their breakdown by type was 21% private, 71% semi-private and 8% municipal. About one third of the new courses were associated with real estate developments. The total golf course openings of 352 for 1970 were about 9% less than in 1969 when 397 new facilities opened for play.

The leading states with new golf course openings in 1970 were Florida, 26; Texas, 24; California, 21; New York, North Carolina and Pennsylvania, each 18; Michigan, 16; Georgia, 14; Washington and Wisconsin, 13; Illinois, 12; Iowa and Virginia, 11; and Minnesota 10.

NGF records reveal there were 10,188 golf courses in play in the nation at the end of fiscal year 1970. Of these, 4619 were private operations; 4248 were semi-private or daily-fee types and 1321 were municipal. 5343 were 9-hole layouts; 4845 were 18 holes or more. Regulation length courses totaled 9083; the remaining 1105 were par-3 layouts.

NGF estimates there are now 9,700,000 golfers in the United States who play more than 15 rounds annually. Another 2,200,000 play fewer than 15 rounds — making a total of 11,900,000 golfers.

Trends indicate that golf facility development will continue at a fast pace. Great strides are expected in housing development throughout the nation in 1971 due to somewhat lower interest rates and more money being made available for mortgages. Housing developments frequently include golf courses, swimming pools and other recreation facilities. Builders are selling environment as well as houses — thus providing a place for one to live and play. Probably a third of the new golf courses built in 1971 will be associated with housing developments including new planned communities, high rise apartment and condominium complexes and vacation or resort homes.

ing such facilities. The greater Cleveland area has 162 holes of municipal golf—72 holes operated by the Cleveland City Department of Parks and Recreation and 90 holes operated by the Cleveland Metropolitan Park System.

The Cleveland City operation includes two excellent 36-hole facilities — Highland Park and Seneca. Both have complete irrigation systems. The first two Cleveland Opens were played at Highland Park in 1964 and 1965.

Green fees for 18 holes at the Cleveland courses are $3 any day. Also available is a season rate good for unlimited golf play—cost: $115 for residents; $190 for non-residents. Senior citizens age 65 and over may play golf on Monday, Tuesday and Thursday until 3 p.m. at the special rate of $1 for 9 holes; $1.75 for 18.

The six municipal courses (90 holes) operated by the Metropolitan Park System are under the general supervision of Harry Burkhardt, Superintendent of Golf for Cleveland Metropolitan Parks. Like the Cleveland city facilities, they are excellent golf courses. Green fees on the metropolitan courses vary from $3 for 18 holes and $1.50 for 9 to $4 for 18 and $2.25 for 9, depending on the course played. Many of the area industrial leagues use these courses and the play all week is reported as heavy.

Cincinnati, Ohio, has for years enjoyed a popular and successful municipal golf operation. The four courses operated by the City Public Recreation Commission are under the direct supervision of Robert J. Strauss, Supervisor of Golf.

A reservation system is in effect—a fee of 10¢ per person is charged for a reserved starting time. Green fees for 18 holes are $2.60 weekdays; $3.30 weekends and holidays. No season rates are available. Golfers may rent a set of clubs at any of the courses for 50¢—a major inducement for a beginner to try the game. Last year rentals totaled 15,736 sets.

Robert Strauss reports that 14 powered cars were made available at each of the four courses in 1970. They were an immediate success and the number per course will be increased to 20 in 1971. Rental fees for 18 holes are $6 weekdays; $7 weekends and holidays.

Says Strauss, "Perhaps the most meaningful municipal golf programs we have initiated have been the Men's Senior Golfers Organizations and the Women's Golfers groups formed at each of the four courses. These groups are granted weekday morning starting time reservations

and pay regular green fees. They conduct their own affairs completely—have wonderful golfing fun and use the courses at times when play is not too heavy."

Membership in each of the organizations is held to 100 because of starting time limitations. Clubs at two of the courses have waiting lists. Senior citizens may play 18 holes for $1.50 Monday through Friday from opening of course to 12:00 noon tee-off time.

A Youth Golf Association involving hundreds of boys and girls 18 years of age, or younger, is also sponsored by the Cincinnati Recreation Commission. Requirements for membership — signing a pledge to abide by course rules and the etiquette of golf and payment of a $1 annual registration fee. Members have the privilege of playing one day a week at each course during specified hours for a $1 green fee. During summer vacation YGA members must tee off before 10 a.m. and complete their play by 2 p.m.

Atlanta Operational Policies

Atlanta, Ga., operates seven municipal golf courses—four 18-hole layouts and three 9-hole facilities—a total of 99 holes. Brown's Mill, a new 18-hole course, opened for play in September, 1970. The city plans to have two additional 18-hole courses by 1985.

According to Martin Petsonk, City Superintendent of Golf Courses, golf play on the Atlanta courses has been averaging about 200,000 rounds annually. There is no reservation system; they operate on a policy of first come, first served. Weekday 18-hole green fees are $3; weekends and holidays $4. Nine-hole fees are $1.50 and $2 respectively. City offers season rates as follows: yearly pass good on all city courses—$100; yearly pass good only on one course—$75; senior pass (over age 65) good on all courses—$50. All golfers must sign in with the golf starter. Foursomes only are permitted on weekends during periods of heavy play.

Powered golf cars are available. They have an average of 30 cars at the 18-hole courses; 15 cars at the 9-hole facilities. Course regulations state that powered cars must stay off tees and 30 feet from the greens. There can be only two riders to each car and riders must have valid driver's licenses.

Union County Golf Program

The Union County (New Jersey) Park Commission has for years had a very successful municipal golf

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operation. Its facilities include the 27-hole Galloping Hill course at Kenilworth and the 18-hole Ash Brook layout at Scotch Plains. According to George Cron, General Superintendent, Galloping Hill serves about 85,000 players a year; Ash Brook averages 60,000 annually.

Galloping Hill Golf Course maintains a fleet of 30 powered cars; Ash Brook has 25. Rental fees are $8 for 18 holes; $4 for 9. Union County has a special green fee schedule for county residents who annually qualify for a golf identification card. This fee is only about half the amount charged non-resident players. Green fees for out-of-county players for 18 holes are $4 weekdays; $6.50 weekends and holidays.

Increased Maintenance Costs

Like most expenses, those for course maintenance are increasing, so some municipalities are raising green fees. Atlanta, Ga., this year increased its 9-hole weekday rate from $1 to $1.50 and 9-hole weekend rate from $1.50 to $2. Eighteen-hole weekday rate went from $2 to $3; weekend and holiday rate, $3 to $4.

Asheville, N.C., raised its annual resident season permit from $80 to $100. Fees were also upped this year at the eight Denver, Colo., municipal golf operations. As stated previously, Milwaukee County plans to raise its green fees 33⅓% next year—from $2 to $3 for 18 holes. The prevailing rate at many mid-Atlantic municipal courses for 18 holes is $3 weekdays; $4 weekends and holidays; after 5 p.m.—$2 any day.

Maintenance costs increased about 6% last year. Over the past 15 years they have increased 85% .Findings of a nationwide survey of 75 representative courses reveal maintenance costs averaged $4,577 per hole of which $2,824 was for salaries and wages and $1,753 for all other expenses. Range for an 18-hole layout was from about $60,000 to more than $100,000.

Golf Course Planning

When should a municipality consider the develoment of public golf courses? An acceptable yardstick for daily fee and municipal courses is one 18-hole operation for every 20,000 to 25,000 persons. City and town officials considering the development of a municipal golf course often appoint a citizens committee to make a detailed study for such a project along with specific recommendations for its accomplishment—if the project is deemed feasible.

Included in the study will be complete justification for the need and desirability of a golf course for the area; suggested sites along with expected land acquisition and course construction costs; suggested methods of financing the entire project and estimated operating income and expenses for the planned facilities.

Many municipalities developing golf facilities are taking advantage of a state grant-in-aid program administered by the Bureau of Outdoor Recreation, U.S. Department of Interior. Under this program, local governments may submit requests to their respective state offices for outright grants to acquire or develop urgently needed public outdoor recreation facilities.

Most existing municipal golf courses were financed by general obligation bonds issued by the municipality concerned or by general budget allocations. In recent years, cities and counties having legal authority to do so have financed many municipal courses through the issuance of revenue bonds which are payable from the net income received from the operation of the golf course.

Such net income can be and often is substantial. Municipal golf courses can be profitable if realistic green fees are charged and the facilities are properly managed. Actually, golf course revenues can and frequently do go a long way toward providing the free recreation facilities for communities since the golf course usually is the largest revenue-producing unit in a recreation program.

And this is but one of the ways in which a golf course benefits a community. There are many others. Golf facilities stimulate civic pride and create new business; they beautify and preserve open space and increase property values in surrounding areas; they attract new industry, tourists and conventions and —perhaps most important — they provide healthful, enjoyable recreation for all age groups.

It is doubtful that the nation will ever have sufficient municipal golf courses to meet the constant growing need. It is certain that municipal golf will play an increasing role in the overall American golf scene in the years ahead.

insect report

TURF INSECTS

AN AEROCCOCCID SCALE

(Eriococcus carolinae)

MARYLAND: Light infestation on beachgrass near Ocean City, Worcester County. This is a new state record.

A MARCH FLY

(Dilophus orbatus)

CALIFORNIA: Larvae 1,000 per square yard in one-eighth acre of *Lippia* sp. and grass sod in nursery at Oakland, Alameda County. Larvae 15 per square foot in some lawns and up to thousands along walks and driveways at Sacramento, Sacramento County; 50 per square yard at Fresno, Fresno County. Adults heavy in some lawns at Madera, Madera County.

INSECTS OF ORNAMENTALS

A CONIFER APHID

(Cinara tujafilina)

OKLAHOMA: Counts and colony size increased on arborvitae in Payne County past 21 days. Up to 25 aphids per colony.

YUCCA PLANT BUG

(Halticotoma valida)

MISSISSIPPI: Moderate to heavy on yucca plants in Montgomery, Choctaw, and Oktibbeha Counties.

TREE INSECTS

ELM LEAF BEETLE

(Pyrrhalta luteola)

KANSAS: Overwintering adults found under firewood at roadside park north of Syracuse, Hamilton County, and same location in park at Tribune, Greeley County. These are new county records. Now occurs statewide.

OBSCURE SCALE

(Melanaspis obscura)

ALABAMA: Dominant scale species on 80% of oak trees growing on lawns and streets at Auburn, Lee County. Many heavily infested with lower limbs dead or dying. Scales on many limbs touch and overlap.

meeting dates

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

25th Northeastern Weed Science Society at Hotel Commodore, 42nd Street at Park and Lexington Avenues, New York City. Jan. 6-8.

Georgia Golf Course Superintendents Association annual meeting at Callaway Gardens, Pine Mountain. Jan. 10-12.

Mid-Atlantic Association of Golf Course Superintendents turf conference at the Holiday Inn, Howard and Lombard Sts., Baltimore, Md. Jan. 11-12.

Tennessee Turfgrass Association annual conference, Sheraton Hotel, Nashville, Tenn. Jan. 11 and 12.

New Jersey Recreation and Park Association 5th annual parks symposium. Lewis M. Herrman Labor Education Center, Rutgers University, New Brunswick, N. J. Jan. 13.

University of Nebraska annual turf conference, Lincoln. Jan. 13-15.

23rd California Weed Conference. Woodlake Inn, Sacramento, Jan. 18-20.

Associated Landscape Contractors of America ninth annual meeting and trade exhibit at the Royal Orleans Hotel, New Orleans, Jan. 18-22.

Southern Weed Science Society 24th annual meeting at the Sheraton-Peabody Hotel, Memphis. Jan. 19-21.

41st Michigan Turfgrass Conference. Kellogg Center, Michigan State University, East Lansing. Jan. 26-27.

Virginia Turfgrass Conference, Sheraton Motor Inn, Fredericksburg, Va. Jan. 26-27.

Pennsylvania-Delaware Chapter, International Shade Tree Conference, 6th annual Shade Tree Symposium. Memorial Hall, 44th and Parkside, Fairmount Park, Philadelphia. Jan. 27-28.

42nd Golf Course Superintendents Association of America International Turfgrass Conference and Show. Denver Hilton, Denver, Colo. Feb. 7-12.

Weed Science Society of America. Statler-Hilton Hotel, Dallas, Tex. Feb. 8-11.

National Landscape Association, Admiral Semmes Hotel, Mobile, Ala. Feb. 14-17.

National Arborist Association, International Inn, Tampa, Fla. Feb. 14-18.

National Symposium on Park, Recreation and Environment Design, Sheraton O'Hare Motor Hotel near Chicago. Feb. 15-17.

Regional Lawn and Garden Retailers Day, Half-Way House, Darien, Conn. Feb. 18.

Penn State Turfgrass Conference, Keller Conference Center, Campus, Pennsylvania State University, University Park, Pa. Feb. 22-25.

Midwest Regional Turf Conference, Purdue University, Lafayette, Ind. Mar. 1-3.

Ground Maintenance Conference, University of Connecticut and Southern Connecticut Groundskeepers' Association, Waverly Inn, Cheshire, Conn. Mar. 3.

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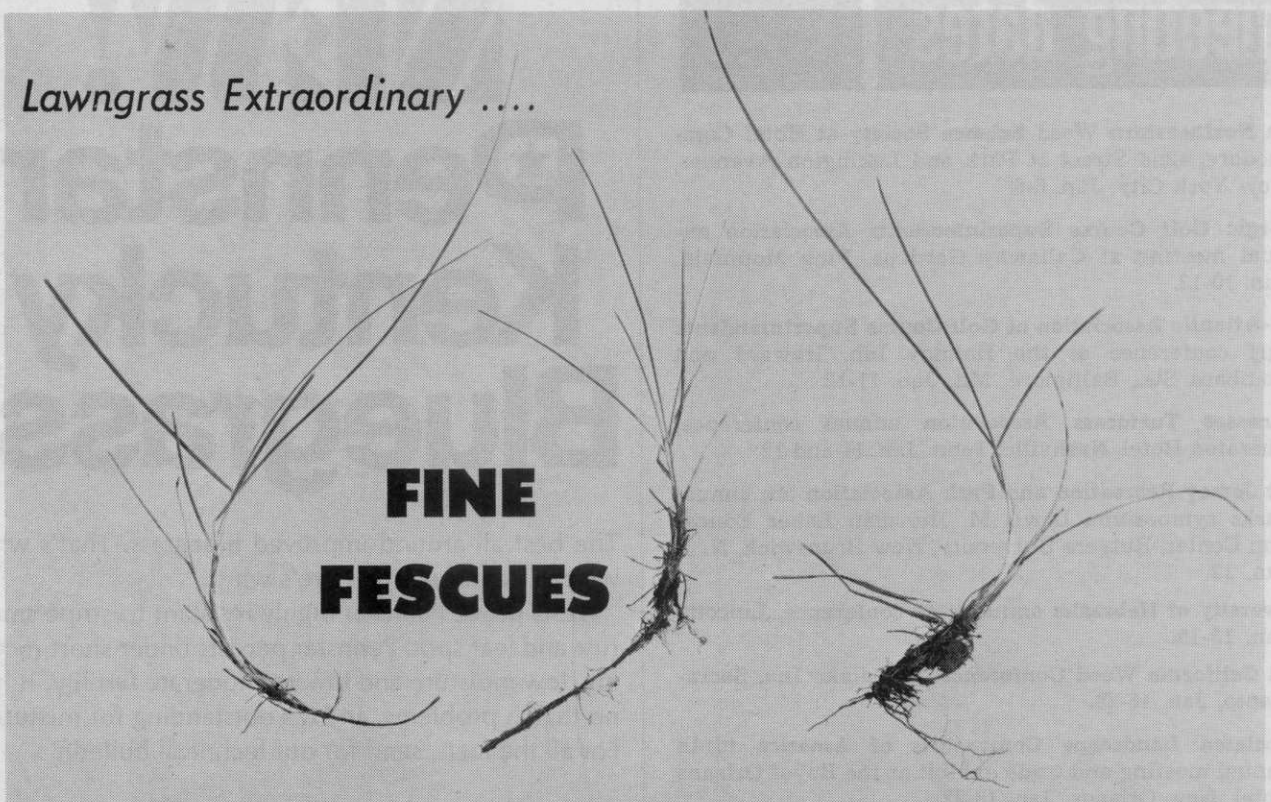
FINE FESCUES



Individual plants of fine fescue are from the left Pennlawn, Wintergreen and Highlight. In these samples, Wintergreen displays a prominent rhizome, Highlight almost none. Lawn Institute photo.

By DR. ROBERT W. SCHERY, Director
The Lawn Institute

THE FINE or red fescues, *Festuca rubra,* in many varieties and subspecies, is circumboreale today but probably of European origin. Fine fescue is one of the two major lawngrasses utilized generally for fine turf in North America and Europe, where the custom of having ornamental home lawns has become so widely perfected. Fine fescues are especially noted for their attractiveness and tenacity where growing is difficult, such as on poor soil, in dry locations, and under shade. They make an excellent companion for Kentucky bluegrass in the seed blends used for lawns from the border states northward in the United States.

The fescue group is a confusing one, the distinctiveness even of species often being based upon obscure characteristics. It is not at all strange, then, that variety identification becomes all but impossible for anyone but the expert. Varieties are distinguished mostly by physiological response and resistance to disease, rather than by distinctive visual features. The species spreads by underground stems or rhizomes, but the Chewings type *(F. rubra commutata, = F. r. fallax)* is theoretically a bunchgrass. However, all cultivars seem to yield plants that have at least a degree of the rhizoming habit. Whether an individual plant grows in tufts or spreads by rhizomes may be more a response to habitat than to genetic makeup! There is little doubt that widespread crossing occurs between varieties throughout the world, and many cultivars no doubt contain both "creeping red" and "Chewings" blood lines.

In North America, fine fescues are listed by Hitchcock as endemic in all except a few of the prairie states and those bordering the Gulf of Mexico. They are very much at home in the more northerly regions, and volunteer widely in western Canada. *Festuca rubra* usually resents waterlogged soil in hot weather, but ecotypes are found in marshy habitat both in northern Europe and many parts of North America (viz., according to Hitchcock, "meadows, hills, bogs and marshes in the cooler parts of the northern hemisphere, extending south — to the San Bernardino mountains — New Mexico— the Allegheny mountains and the Atlantic coastal marshes to Georgia.").

Chewings fescue, was for many years exported to the United States from New Zealand, but shipping difficulties and inability to maintain high standards of quality helped switch seed production to Oregon where most Chewings is now grown. An Oregon selection of Chewings is known as Cascade.

Fine Fescue Traits

The fine fescues have many attributes marking them as top lawngrasses. The foliage is of an attractive, delicate texture, yet dense enough to restrain weeds well; its color is a lustrous dark green that blends beautifully with most bluegrasses. The leaves themselves are rather wiry and resilient; leaf margins are generally rolled inward giving a curled appearance to the leaf in cross section, especially during dry weather. The leaf sheaths are fibrous, reddish, persistent, a good distinguishing feature helping to identify fine fescue in a mixed turf.

Rhizome spread is not so manifest as with bluegrass, but most varieties expand well to fill-in scarred sod. Seedheads are produced early in summer, but are seldom much in evidence with plants crowded into a lawn. The grass is a little more fibrous than is bluegrass, and should be mowed with equipment kept sharp and in good adjustment.

It is apparent that fine fescues adapt widely, although their turf quality is not the best in hot-humid climates. They are very tolerant of soils, thriving on everything from peaty bogs to near sands and on infertile, rocky mountain sides. As to fertility, they can take it or leave it. Tests confirm that fescues have a better color and appearance when well fertilized, but seldom is it necessary to use more than two or three pounds elemental nitrogen (N) per 1,000 sq. ft. (M) annually, — considerably less than with most lawn species. As with bluegrass, fertilization is best practiced during the cooler parts of the year. Fine fescues are good insurance in a seed mixture for lawns that cannot be intensively tended; they usually survive where lesser grasses won't, — in sandy, wind-swept spots, for example, or on dry, infertile parts of the lawn. They persist in shade where competition with tree roots is often too much for other grasses. Obviously, fine fescues are excellent, low-maintenance grasses, self-sufficient and recuperative.

Fine fescues are quite tolerant to cold (seedlings, of course, may heave in winter, decimation then being more from desiccation than from low temperature). In northern Michigan, Highlight, Pennlawn and Chewings varieties showed the least winterkill in recent tests, and even so far north as Alaska (where many turfgrasses do suffer winter injury) tolerant fine fescues have been found (Arctared, Table 1, is being tested as a possible commercial introduction).

Growth Pattern

Fine fescues follow essentially the Kentucky bluegrass growth cycle. The grass builds up food during cooler weather, becoming dense through proliferation of new tillers, and spreading to a greater or lesser extent by rhizomes. If fertilized in autumn, fescue turf is essentially resplendent the following spring, beautifully thick, of deep color, and with an elegant texture. During summer, fine fescues may experience thinning and become patchy, especially if the weather is hot and muggy, the soil saturated. Die-out is usually blamed on "disease," but seems more a reflection of physiological weakening. Nevertheless, fescues are attacked by several diseases, of which leafspot *(Helminthosporium)* is serious as weather warms, and redthread *(Corticium)* and snowmold *(Typhula, Fusarium,* etc.) more active in cooler weather and winter. Where summer weather encourages patchiness, fine fescues are usually blended with Kentucky bluegrass. Sparing use of fertilizer during the warm season should also help withstand disease. High mowing (1½ inches or more) aids survival, yet in equable climates such as England fine fescue can be mowed as low as is a bentgrass. Winterseedings of golf greens in the South with mixtures containing fine fescue also survive for the season mowed at one quarter inch.

Maintenance

Maintenance requirements are not onerous with the fine fescues. Rather casual fertilization often suffices, a pound or two of N/M keeping the grass reasonably attractive. Up to 6 lbs. N have been used with spectacular results so far as color and density are concerned, but only in northerly locations where summer problems are not serious. As with any grass, fertilization should be matched to the soil, keeping in mind that by-and-large fine fescue gets by with half or less the amount of fertilizer recommended for elite bluegrasses, bentgrasses and bermudagrasses.

With so drought-tolerant a grass, irrigation is seldom vital, but as for any well-kept turf is needed during periods of drought in order to hold the grass green. Be especially careful with fine fescue not to over-water, something that can prove disastrous on poorly drained soils in warm weather.

Because of their density and tenacity, fine fescues remain relatively free of weeds without much attention. There is even a hint that they inhibit the sprouting of weed seeds; weed seedlings may have difficulty gaining a toehold. When weeds do occur, fine fescue is reasonably tolerant of the conventional herbicides. Phenoxy materials used at recommended rates free fescue from most broadleaf weeds without injury. Fine fescue is a little less tolerant to some pre-emergence crabgrass preventers than is bluegrass, damage having been reported from bandane, benefin and DCPA; on the other hand, if kept on the dry side, and used as shade grass (as often is the case), there will not be much crabgrass

BOOK REVIEWS

THE PLANT KINGDOM by Ian Tribe, The Rowland Co., Inc., 415 Madison Ave., New York, N.Y. 10017.

What is a plant? The answer is not so simple, according to Dan Tribe, author of Plant Kingdom, one of the interesting and informative books in the new Grosset & Dunlap series of all-color guides. "It's easy to say that a plant is green, has stems, roots and leaves," he says. But numerous exceptions can be found. Some plants are yellow, brown or red. And roots and leaves do not appear as such in the lower order of plants. The author breaks down the vast membership of some 300,000 recognized members or species into major groupings. Among these are algae, mosses and flowering plants. Next he considers the plant as a living organism which grows and reproduces itself. The amazing solutions to living within the plant kingdom rival in interest and variety anything that can be said about animals, Tribe asserts. The book has 410 color illustrations.

TURF MANAGEMENT HANDBOOK by Howard B. Sprague, former executive secretary of the Agricultural Board of the National Research Council, National Academy of Sciences. Interstate Printers & Publishers, Inc., Danville, Ill. 61832. $9.25

This book is a practical guide to turf culture, explaining the life processes involved, and describing the specific grasses, materials, equipment and procedures that have been found to produce desirable results with a minimum of effort and expense. Here are the chapter subjects: (1) Basic information; (2) Soil conditions for healthy turf; (3) Soil acidity and liming to correct it; (4) Practical use of fertilizers on turf; (5) Soil humus and grass management; (6) How grasses grow; (7) Characteristics of turf grasses for cooler regions; (8) Characteristics of turf grasses for warmer regions; (9) Planting new turf; (10) Regular care of turf; (11) Special turf problems and renovating poor turf; (12) Controlling weeds; (13) Controlling diseases; (14) Controlling insects and other pests; (15) Seasonal schedules for management of turf areas. The book has 258 pages and numerous illustrations.

A partially separated plug of fine fescue mowed about 1¾" high. Note dense growth of tillers, fine texture, and persistent leaf sheaths. Lawn Institute photo.

competition in any event. At the Lawn Institute, fine fescue has been singularly free of coarse species, seeming in time to "squeeze out" tall fescue, timothy, and even quackgrass.

Fine fescues are tolerant of the familiar insecticides and fungicides. Sod webworms, chinch bugs, and other insects, can be controlled with most any insecticide approved for household use, if applied as directed. At the Lawn Institute, there has been little need for or benefit from fungicide applications, but reports indicate that persistent application of a fungicide may help prevent summer thinning. Named fescue cultivars being bred today are at last in part selected for some immunity to disease.

Propagation

Fine fescue is propagated almost exclusively by seed. Consumption of fine fescue seed in the United States reaches almost 30 million pounds, about half imported. Most domestic seed is sold as named varieties, generally preferred because of pedigree and because it is carefuly grown as an agricultural crop rather than simply harvested from volunteer stands (as is often the case in western Canada).

Fine fescue seed is of medium size, abundant enough by the pound to be quite a bargain (over a half million seeds to the pound, yet large enough to distribute easily and carry sufficient nutrients for excellent seedling vigor. Fescue included in a bluegrass blend sprouts somewhat ahead of the bluegrass, and is really a superior "nursegrass" to some of the temporary grasses that contribute nothing to the eventual sod. Domestic seed is mostly cleaned up to a high level of purity, and is free of pernicious weeds or coarse crop species. On the modern label fine fescue joins bluegrass and bentgrass in the "fine-texture" category, in such varieties as are listed in Table 1 at the end of this article.

Fescue is usually sowed 3 or 4 lbs./M alone, or 2-3 lbs./M in mixtures with bluegrass. The seed distributes very nicely in modern lawn spreaders. If the weather remains warm and the new seeding is well watered, fescue should be visible in about a week. A mulch is recommended over new seedings to prevent drying out, ensuring more rapid germination. Recent studies by Dr. Wood at the University of Vermont indicate that fine fescue tops the list of grasses tested for seedling tolerance to drought. The variety Golfrood was especially noteworthy in the data reported.

Table 1. Fine fescues commercially available or expected soon in North America.

Arctared	Illahee
Boreal*	Jamestown
Cascade	Olds*
Chewings**	Pennlawn
Duraturf*	Rainier
Golfrood**	Ruby**
Highlight**	Wintergreen

* Canadian
** European origination

Table 2. European fine fescue selections still under test, or not available in the United States.

Barfella, Bargena, Bergere, Brabantia, Cottage, Dawson, Echo, Elco, Erika, Oasis, Polar, Reptans, Rubin, S-59, Sceempter, Steinacher, Tjelvar, various selections known by code numbers only (including a number of American selections).

Varieties

The great similarity in appearance between fescue varieties has been commented upon; most are interchangeable. This similarity also extends in some degree to performance; reports indicate now one, now another selection slightly superior a given year, a given location or a given season.

As is evidenced by Tables 1 and 2, a search for improved fine fescues is in full swing. Many new varieties appear each year, a number of them developed in Europe and sent to Oregon for seed production. Some are bred for density when planted alone, others with more open growth for blending with Kentucky bluegrass.

Pennlawn is an especially interesting case. It was bred some years ago from parental selections made at Pennsylvania State University, selected for resistance to disease. Dr. Musser had accumulated promising clones from the golf course fairway (seeded several decades before to seed of European origin) and from seed of domestic and foreign sources. Three superior strains (F-55, F-74, F-78) were eventually screened out on the basis of performance both at University Park Pennsylvania and Beltsville, Md. Planted together, they yield seed that is the synthetic variety Penncross, superior to any of the parents alone.

Very similar to the fine or red fescues are the hard or sheep's fescues *(F. ovina)* of which one or two turf varieties are now being developed. Neither the fine nor the hard fescues should be confused with the tall fescue group *(F. arundinacea)*, however for the latter are coarse varieties used mostly for pastures (but also planted to lawns in the upper South, where the hot summers are inimical to fine fescue and Kentucky bluegrass).

Table 1 lists fine fescue varieties available on the market today, or expected soon. Table 2 lists additional cultivars not generally available in this country. Some of the coded selections may become fescue stars of the future if they pass their screen tests well. Meanwhile the traditional varieties such as Chewings, Illahee, Pennlawn and Rainier carry on, doing all the things a fine fescue is meant to do, including backing up Kentucky bluegrass in lawn mixtures offered generally from the border states northward in the United States.

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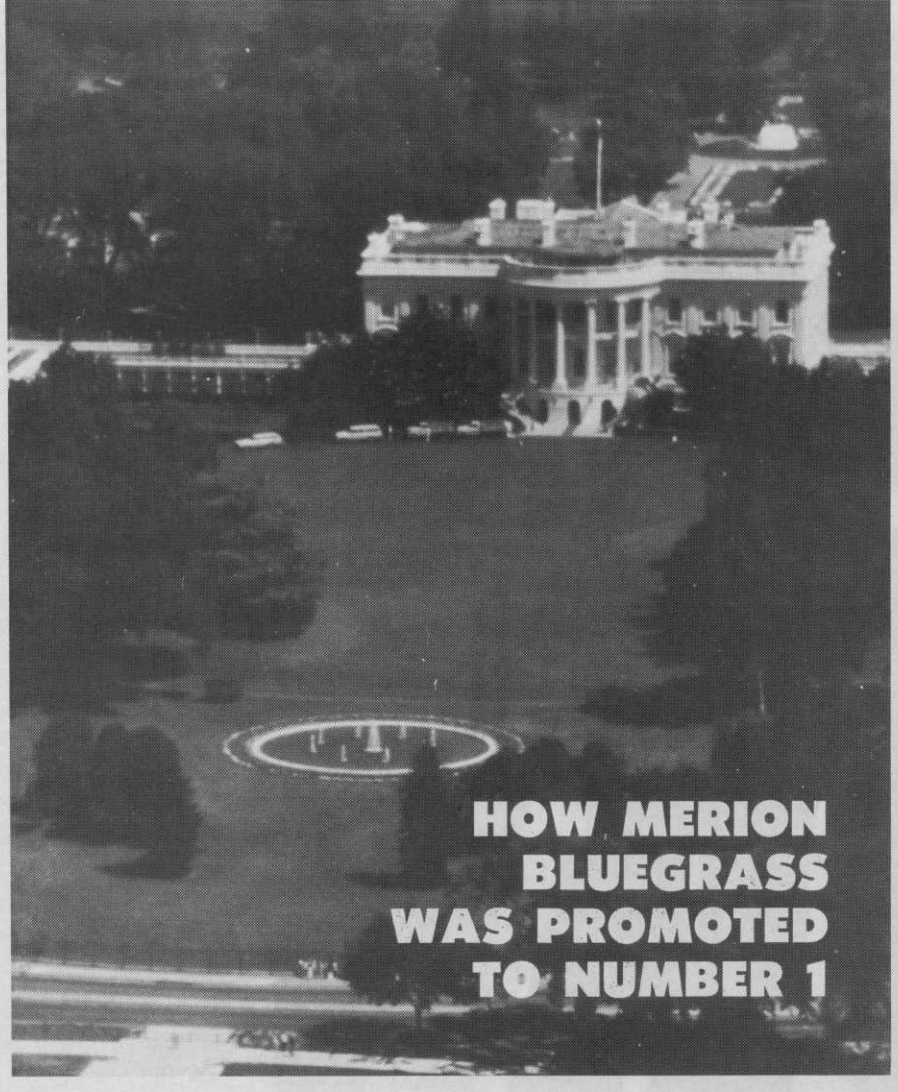

HOW MERION BLUEGRASS WAS PROMOTED TO NUMBER 1

By MARGARET HERBST
Director of Information
Merion Bluegrass Association

PROMOTION of Merion Kentucky Bluegrass has been a process of carefully selecting ideas, proceeding step by step in a consistent program, and adopting new projects each year to supplement those found most effective. Promotion really began in 1954.

We started with the establishment of trial grounds in various parts of the country to establish authority for recommendations in planting and maintenance.

Here was a new grass that had to be handled in a way all its own.

We honored the men who had pioneered in the development of Merion: Joe Valentine, its discoverer, Burt Musser of Penn State and Dr. Fred Grau.

To show of its beauty, and for publicity purposes, Merion sod was installed at the "House & Garden" model home for the first time. Naturally, magazine and newspaper articles played their part in the campaign. The first trade ads appeared and the first cultural folder was produced. The year culminated in the production of a film which could still be used.

Technical Bulletins

In 1955, technical bulletins were produced based on the trial ground work. The M.B.A. story was carried to trade meetings, and the first sales aids were developed. Grants were made to Penn State and Purdue for the study of rust, which had reared its head. The first newspaper ads were scheduled, visits were paid to dealers, the film went into distribution, and the booklet "The Greatest of the Grasses" was issued embodying all of the latest research.

Visits to the trial grounds were on the agenda in 1956. An exhibit was staged at the Garden Supply Merchandiser Show, and a talk on merchandising given at the American Seed Trade Association Convention. That was the year when the officers and Board of Directors went down to the Madras area; the growers there were refusing to be taxed without representation. We put on a repeat of the annual meeting that will never be forgotten by those in attendance—and the growers gave their support once again. For the first time, Australia began to promote B-27, the name that is still used in commerce by that continent. B-27 has now been planted in every capital.

In 1957, the technical bulletins were stepped up. Revisions had to be made in the booklet "The Greatest of the Grasses." The first magazine ads were scheduled, plus heavy newspaper insertions. The Long Island Garden Show, for the first time, featured Merion sod in every garden. Our film was shown on television in a number of cities. Competition with Common Kentucky Bluegrass had to be met, and our growers and members needed stimulation; the first version of the brochure on the Merion Bluegrass Association thus came into being.

The next year we gathered together endorsements by turf authorities in different parts of the country. A three-page spread in *LOOK* Magazine on Yankee Stadium appeared and was merchandised. Fenway Park in Boston installed Merion sod. For the first time, I talked before golf course superintendents at the Massachusetts Turf Conference held at Amherst. Lower prices were now in effect, and the fall campaign was accelerated. Before the advent of Merion, a spring campaign was considered more important.

Education for Better Sales

In 1959, it was apparent that sales clerks needed more education for better sales. The special brochure produced for this purpose was widely distributed. As a result of endorsements by turf authorities, two posters were developed, one on Testimonials and the other called "Ten Reasons," which are still useful. The consumer had many questions about the new grass; we analyzed the ten most frequently asked questions, and their answers became the basis of the leaflet "Care and Maintenance." Our grass even became part of the National Flower competition.

In 1960 the same procedure was followed of researching the ten most often asked questions and their answers on planting, which led to a companion brochure. With lower prices, mixtures could be upgraded, and for that reason the spring campaign was stepped up. Greater competition now existed with the advent of Park and Newport. Another new technique was initiated with the Lawn News series of radio recordings, produced for spring and fall seasons, and regularly utilized by almost 200 stations even today.

Each year our editorial approach has been consistent throughout the

planting seasons according to the theme adopted for the time. In 1961, we featured athletics, with the idea that the home gardener could take advantage of the grass chosen by the professionals and by their methods. The Long Island Garden Show was still being sodded with Merion in every garden.

Television Promotion Began

In 1962, a new television project was inaugurated—to augment the successful radio promotion. This took the form of a script and illustrative material for the program director to employ with ease; a similar technique continues with variations that have had film and color slides for illustration to take advantage of the increased number of color TV sets. Summarizing the years of promotion, the "Merion Motivation" brochure was issued for trade distribution. A larger fall budget was again adopted.

The next year we found it necessary to change recommendations in cultural practices. "The Greatest of the Grasses" was again revised after checking the changes with turf experts in different parts of the country. That was the year when the White House lawn was sodded and we had some extraordinary publicity coverage. The Mets Shea Stadium adopted Merion—a good grass, but a poor club then. Model home promotions were instituted by Jacobson Mfg. Co. and we cooperated in the project.

Famous Lawns Covered

In 1964 an acme of publicity was reached — *LIFE* Magazine had a spread on the White House lawn and quoted the White House gardener on his practices with Merion. As you can imagine, this was well merchandised. Then the New York World's Fair adopted the grass as **the** grass of the Fair; this became the theme of our activities. In fact, we did a radio broadcast right from the grounds, and the Fair scenes were featured in the television offering. Up to this point, activities were centered on the promotion of seed; a change in policy is now beginning to include sod. Assistance was given to the development of the first sod farm literature, and sod was being mentioned along with seed for model home promotions and other projects.

We have now come to 1965, the second year of the fair. Miss Merion Bluegrass, the hydroplane, was named and became a part of the promotion. A quiz kit was produced for clubs and schools including slides, a recording, script and booklet material. Eleven years have passed in this chronicle during which time there had not been a noticeable increase in production. Suddenly this prima donna of a grass produced a heavier crop. We always operate on the money raised from the previous year, and careful appraisal had to be given to the program. The budget also had to include sodding promotion. The first booklet was then produced on Merion Bluegrass sod after consultation not only with turf experts, but also with sod experts. This was a mammoth job—to coordinate all of the regional differences in opinion and performance.

Sod Boom and Seed Quality

In 1966, the editorial material now pertains to seed and sod. New advertising mats on sod were offered to the trade. There was a most spectacular increase in crop production. This was also the year of the drought, and when it was discovered that Merion was so drought resist-

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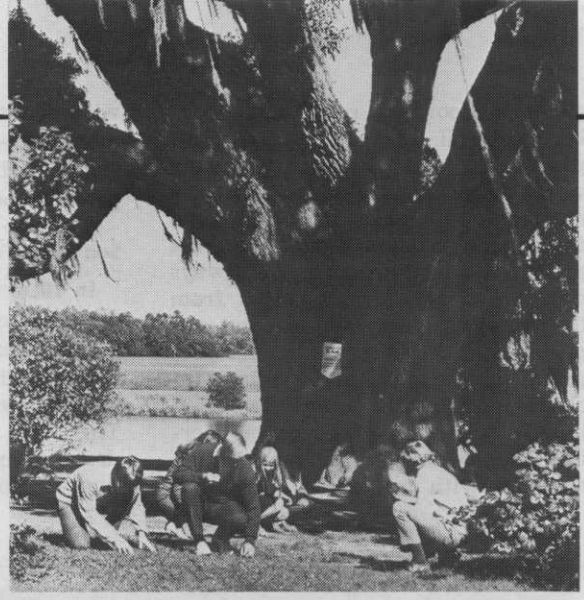

Nursery Plants Acorns From Famous Trees

ACORNS from the famous Middleton Oak are being cultivated in a Texas nursery. The progeny will be sold under the registered trademark, "Heritage Oak."

On a visit to Charleston, S. C., last spring, nursery owner Wash Storm, Jr., and his wife visited Middleton Place to see the stately tree—a landmark in America's oldest landscaped gardens—estimated to be near its 1,000th birthday by the Charleston Museum.

"We read a description of the Middleton Oak and wanted to see it. We've been interested in selecting acorns from trees with historical significance for some time," the Storms explained.

Among the approximately 150,000 trees growing on their tree farm, there are off-spring of the Davy Crockett tree at tne Alamo in San Antonio, Tex.; the Goose Island Oak, Goose Island State Park, Texas, and "Oak Alley" in Vachery, La.

Historically, the Middleton Oak can hold its own. It was an Indian Trail Tree long before Columbus discovered America. In later centuries, it gave shade to successive generations of the Middleton family and their guests —including Henry Middleton, president of the First Continental Congress; Arthur Middleton, a signer of the Declaration of Independence; and his son, Henry, a governor of South Carolina and Ambassador to Russia. Since Middleton Place was opened to the public in the 1930s, it has been admired by thousands of visitors each year.

Storm started his nursery in 1938, suspending operations during World War II. He served in the Air Force for 4 years. In 1969 he sold more than 12,000 trees primarily to nurseries and landscapers. Orders for 1970 are even greater with one shipment earmarked for the LBJ Library at the University of Texas. Other famous buyers are Disney World in Orlando, Fla., Six Flags Over Texas and the Texas Governor's Mansion in Austin.

Since opening the nursery, Storm has experimented with methods to produce fast-growing oaks. He relies on careful selection rather than hybridizing methods. He raises several varieties of oak as well as other trees and shrubs, but his concentration is on the live oak.

Discussing the growth potential of the live oak, Storm estimates that a fledgling with a trunk measuring one and one half inches in diameter may—within a decade—grow to a height of 15 to 20 feet and have a diameter measuring eight to 10 inches, but "only if the tree is properly planted and cared for."

An example of Storm's success wtih live oaks stands in the yard of Mr. and Mrs. Walter Carroll of Premont, Tex. Storm planted the tree in 1941. Today it has a circumference of almost seven feet near the base and a trunk diameter of nearly 28 inches.

The Middleton Oak acorns, he reports, are doing very well at this stage of their growth. Another shipment, gathered by high school students, will soon go into the fertile Texas earth. Some of the acorns are planted in fields, the others in four-inch pots. The young trees will be sold to beautify landscapes hundred of miles from their Ashley River home.

ant, this theme was played up.

The following year, going back to our authorities, it was confirmed that Merion was still the No. 1 grass. More new grasses were appearing on the market, and we needed this research information to carry on an effective campaign. Merion became the grass of Expo '67 in Montreal, as it had been at other fairs. The sod boom was on, more and more stadiums were installing Merion sod, and our TV featurette played up sod in color. Our boat "Miss Merion Bluegrass" had its play when it won the Orange Bowl Regatta and was seen on network television.

As a result of the research of the previous year, the booklet "Merion Still First" was conceived and widely distributed. Our members and growers needed pepping up and the Merion seal program was adopted. Foreign seed was coming in that contained poa annua; it became necessary to call attention to the superiority of Northwest-grown seed in various ways, including carrying the message to golf course architects. Color slides were used for the first time in the television featurettes.

In 1969, special mailings were directed to the sod growers. A second sodding booklet going into aspects of maintenance became necessary, due to the large amount of mail on that subject. Competition was increasing from other new grasses; a study was begun on the best mixtures with Merion and these new grasses. Our crop this year had returned to a lower figure; but the all-time sales figure of a disappearance of more than five million pounds had been achieved. The spring theme became a tie-in with National Lawn & Garden Week, a promotion instituted by the U. S. Department of Agriculture.

And now we are approaching the present. Before this, competition had been with other natural grasses. Suddenly the Houston Astrodome and artificial turf came into the news. As a public service, the Association has just published a booklet on the advantages and disadvantages of artificial turf and real grass; copies are available.

The complicated subject of regional adaptation of mixtures is still before us. But one thing is certain, "Merion is Still First."

industry people on the move

KOHLER COMPANY, Kohler, Wis., has named E. L. Fisher to the newly created position of director, engine and electric plant service. Three promotions are. Lowell R. Johnson to service manager, engines; Edward W. Dumann to service manager, electric plants, and Frank L. McNamara to manager, technical publications.

* * *

RONALD W. FREAM has joined the firm of Robert Muir Graves, golf course architect at Lafayette, Calif.

* * *

DR. ALVIN L. KENWORTHY, Michigan State University professor of horticulture is the 34th president of the American Society of Horticultural Science.

* * *

HERBERT F. HORNER has been named chief engineer for Ryan Equipment Co., Minneapolis.

* * *

GENE ROBERTS of Dallas, Tex., is a new district sales manager for the municipal sales division of Wayne Manufacturing Co., Pomona, Calif.

* * *

T. A. BAER has been elected vice-president for field supervision for The Davey Tree Expert Company, Kent, Ohio.

* * *

MATT DEES is the new branch manager of the San Antonio, Tex., sales office of Thompson-Hayward Chemical Co., Kansas City, Kans.

* * *

DR. B. LAMAR LEE has been named staff scientist, entomology, for the insecticides, miticides, nematicides unit of the plant health research unit of TUCO, Division of The Upjohn Company.

* * *

PHILIP L. AYERS has been promoted from western district manager to field sales manager, nationwide, for Root-Lowell Corporation, Lowell, Mich.

* * *

GLENN ROBE has been appointed to the new position of chief engineer, test and development, by Jacobsen Manufacturing Co.

* * *

WINFIELD TUCKER of Slocum, R.I., is the new president of the New England Sod Producers Association.

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Cal-Turf Trials Show

WHAT A MOWER NEEDS TO CUT HYBRID BERMUDA

AS THE SOD PRODUCTION industry matures, more growers are taking a look at how their product is performing and how it is being cared for after it leaves the farm. The reason is clear; no matter the cause, if the purchaser is unhappy with the grass, the word gets around. And that's how bad images and declining sales can get started.

Some growers are issuing fertilizing and watering instructions, weed and disease control information, and mowing frequency tips.

On the subject of mowing, Cal-Turf of Camarillo, Calif., probably has conducted the most extensive test program so far to indirectly support the sales effort of one of its turf products.

Total lawn acreage of hybrid bermudagrass is on the increase, including home lawns. A major difficulty that has cropped up with these dense grasses is the extreme difficulty encountered in mowing them properly with the presently available home lawn mowers.

Cal-Turf, working with California Polytechnic Institute at Pomona, undertook a study of home lawn mowers being used on hybrid bermudagrass. The objective was to investigate factors that would enable the homeowner to groom his lawn with success and without having to purchase extremely expensive equipment.

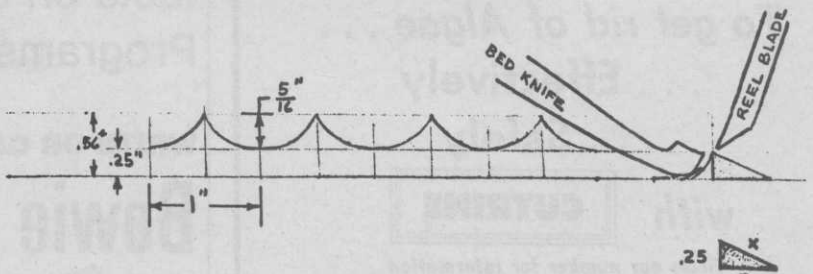
Following is a summary of the mowing trials Cal-Turf conducted. Copies of the entire study are available by special request from Cal-Turf, 5417 Santa Clara, Camarillo, Calif. 93010. Phone 805/485-6757.

Types of Mowers

Presently, the three basic types of mowers available to the homeowner at relatively reasonable costs are the rotary, rear discharge reel, and front-throw reel.

The rotary mowers use a high velocity whipping action for mowing, which tears the grass blade rather than cutting it cleanly. For an effective mowing action, the grass blades should be vertical—the bermudagrass blades and stems are not. Field experience over the years indicates rotaries can't be expected to mow the bermudas in an adequate manner.

Reel mowers utilize a clipping or scissors action in mowing the grass, and the low travel of the bedknife allows the clipping of many semi-horizontal stems and blades found in the bermudas. The rear discharge reel mowers are designed with two wheels forward and a roller to the rear with the bedknife under the



$X = \sqrt{.5^2 + .25^2}$

$X = \sqrt{.312}$

$X = .556$

$.556 - .250 = .306$ or 5/16" variation in height

which is 124 %

forward set of wheels. The grass catcher is suspended behind the rear roller; when clippings fill the catcher, weight is removed from the bedknife, which encourages flotation over the tough bermuda turf.

Front-throw reel mowers have four to eight wheels or rollers which allow for even and constant weight distribution on the turf. These mowers are generally sturdy and relatively heavy, permitting a more even forward movement of the bedknife. Wide experience indicates this type of reel mower has the best potential for properly mowing hybrid bermudagrass turf.

Organization of Trials

Cal-Turf obtained on loan from four manufacturers a total of eight front-throw, homeowner mowers. Three varieties of hybrid bermudagrass turf were sodded into an area at Cal-Poly in Pomona. The area was sanded, leveled and eight mowing strips were set up in such a way that each mower had its own strip and each strip cut across Tifdwarf, Tifgreen and Tifway, under identical conditions.

The mowing trials were headed up by Dan Neff, a senior student at Cal-Poly. Neff performed the weekly mowings himself, and compiled the data. Most of the statistical evaluations, as well as concepts in testing, stemmed from Tobias Grether, president of Cal-Turf.

Constants of the eight mowers included: (1) All were front-throw reel types, readily available to homeowners; (2) The bedknife was set to touch the floor when the mower was positioned on a level concrete surface. (3) All mowers were brand new and were well maintained throughout the trials.

Variable factors between the eight mowers included: (1) Weight of mower at the bedknife; (2) Bedknife design; (3) Clip rate (frequency of cut); (4) Number of blades in the reel; (5) Engine horsepower; and (6) Form of power transmission.

Clip Rate and Turf Ribbing

The hybrid bermudagrasses must be maintained a low mowing heights (½-inch or less) for best appearance and performance. Under many maintenance situations, they show a ribbing or marcelling that somewhat detracts from the turf appearance. This ribbing stems from the relationships between cutting height and frequency of cut, or "clip rate." When the clip rate is greater than the cutting height, ribbing occurs; if the clip rate is equal to or somewhat less than the cutting height, a smoothly mowed surface may be achieved. Fig. 1 shows a mower with a one-inch clip rate (quite common), mowing at one-half inch height (as demanded by the bermudas), and causing a 124% variation in mowing height of individual blades, or severe ribbing.

Mower Design Factors

After several weeks of observation of the trials and study of the individual mowers in the trials, a "mower design factor" was computed mathematically. It is calculated as the area of bedknife contact at ¼" cutting height, times the bedknife thickness expressed in 1/16-inch increments, divided by the mower weight at the bedknife. These appear to be critical factors in successful mowing of the dense bermudas. Fig. 2 shows two examples.

In theory, the best mowing job would be done with the mower having the lowest mower design factor, other things being equal. This would include the weight per square inch of bedknife to press into the

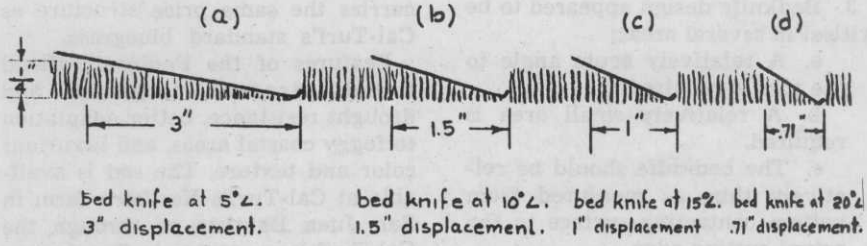
Fig. 2. Mower Design Factors

Mower #5

$$\frac{20.25 \text{ sq. in. (bedknife contact area)} \times 3 \text{ (thickness in 16ths)}}{65 \text{ (lbs. weight at bedknife)}} = 0.94 \text{ (the "mower design factor")}$$

Mower #8

$$\frac{15.0 \times 7}{53} = 1.98 \text{ (mower design factor)}$$



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The golf industry's newest trade group, the Golf Course Builders of America, formally incorporated in November. Directors approved regular and associate classifications of memberships. Regular members will include general golf contractors and others who work closely with them, such as irrigation specialists, fumigators, and turf contractors. Associate memberships are available to the suppliers in golf course construction. Associate members will be entitled to three voting members on the nine-member board; and each will have a one-third vote at general membership meetings. Officers who gathered at the National Press Club for the special meeting in November are from the left: James J. Kirchdorfer, Kirchdorfer Irrigation, Louisville, Ky.; Vice-President Robert Vincent, Jr., Robert Vincent Co., Benton, Pa.; Richard W. D. Jewett, Jr., Hyper-Humus Co., Newton, N.J.; Executive Director Harry J. Lambeth, Washington, D.C.; President David Canavan, Moore Golf, Culpeper, Va.; Secretary-Treasurer J. James Shipe, Turf Industries, Bel Air, Md.; Robert E. Chakales, Chakales & Associates, Richmond, Va.; Floyd F. Hendrix, Hendrix and Dail, Greenville, N.C.; and Parker Shirling, Princeton Turf Farms, Centreville, Md.

heavy and stiff bermuda stems and help prevent thatch buildup from mower flotation. The angle of the bedknife to the turf is critical, as a sharper angle would decrease the bedknife contact area. Fig. 3 illustrates.

Actual Trials

Recorded trials extended over a two-week period beginning in mid-July with mowing on a weekly schedule. The height from soil to grass blade tip was measured at each mowing and a cushion or thatch measurement was made at the close of the trials. An increase in the height measurement indicated inability of the mower to maintain the low level desired which, in turn, would allow thatch to build up. The thatch or cushion accumulation was measured by stacking one-inch steel cubes on a spindle and measuring the depression in the turf as each pair of additional cubes was added to the stack. Heavily cushioned turf will resist penetration of the bedknife to a high degree, thus, this measurement was critical in evaluating actual mower performance in reducing or preventing thatch buildup.

Data from the field trials showed that the least cushion buildup occurred in the strip mowed with the mower having the lowest "mower design factor." Both the height and the cushion depression measurements bore out the mathematically computed notions of mower design and construction. Visual observations of color, scalping and overall appearance showed severe scalping on this strip the first few weeks of the trials, but, upon recovery, the visual ratings were consistently high. It might be well to point out that the trials were not an attempt to pit one machine against another, but rather to discover some of the essential elements in a front-throw mower adapted to mowing hybrid bermudas under a home lawn situation.

Conclusions

1. For mowing the hybrid bermudas, it is essential that a high speed reel or more than the traditional five blades be used in the front-throw reel mower to prevent ribbing. Basically, the clip rate should be in the area of ¼" to ⅜".
2. The bermudas are tough and dense. Models with a 3 hp motor performed better than those with a 2 hp motor.
3. Bedknife design appeared to be critical in several areas;
   a. A relatively acute angle to the turf is required.
   b. A relatively small area is required.
   c. The bedknife should be relatively thin, as measured from bottom contacting surface to the actual cutting edge.
   d. As the area of the bedknife increases, the downward weight on the bedknife must also increase.
4. The mower should be dependable, well-constructed and easy to start.
5. It would be hoped that relatively minor modifications in mower design and construction would not put the final product beyond the financial reach of the average homeowner.

Cal-Turf Announces New Sod Blend

A new sod blend has been developed by Cal-Turf, Inc., specifically for use in Northern California and similar climate areas of the West.

Called Peninsula Blend, the sod is a combination of Manhattan turf-type perennial ryegrass, red fescue, and bluegrass. According to Paul Ledig, sales manager for Cal-Turf, the new blend is not costly, and carries the same price structure as Cal-Turf's standard bluegrass.

Features of the Peninsula Blend include greater toughness and drought resistance, better adaptation to foggy coastal areas, and luxurious color and texture. The sod is available at Cal-Turf's Northern farm in San Juan Bautista or through the Cal-Turf lawn center in San Jose.

Biological Control of Thatch Under Study in Connecticut

Is biological control of thatch to improve the health of lawns and golf greens possible?

The search for the answer to this question is being made by Dr. Jay S. Koths, an associate professor in the Department of Plant Science at the University of Connecticut.

This research was initiated by him in the summer of 1969 with the aid of an $8,800 grant from the Connecticut Research Commission. It is being continued for the next two years under an $8,000 grant from the Green Section of the U.S. Golf Association.

Thatch is normally degraded by its microbial inhabitants. The problem of thatch occurs when rotting of dead plant parts does not occur rapidly enough. It is important to maintain an ecological balance between the addition of grass parts and degradation by the microbes.

The thatch layer may impede water penetration so that the turf may dry out, causing browning. An application of fertilizer may remain on top of the thatch and be of no use to the grass. Finally, if the grass dies, reseeding will be difficult because the seeds do not germinate readily.

To investigate the processes causing this degradation, a description of the microbes living in thatch is being undertaken by Dr. Koths. He is hoping that knowledge of the role of these inhabitants will lead to the manipulation of conditions within the thatch that will enhance degradation.

To sharply change the activity of thatch-degrading microbes, Dr. Koths made some tests involving radical changes in the environment. Covering the turf with a closed polyethylene greenhouse was found to be too severe. Applying sugar solution in a mist increased microbial counts but did not hasten thatch disappearance. Fertilizer applied in the mist improved grass growth but did not speed thatch degradation.

Attempts by Dr. Koths to establish thatch decomposers in turf were partially successful. Efficient thatch-rotting organisms were isolated and grown in the laboratory. Introduced to turf, they became established and could be reisolated. But this approach will not be pursued because the thatch did not disappear faster.

The thickness of the thatch cycle varies in the season of the year. Dr. Koths found that the minimum depth occurred in late August, when the effects of the high temperatures on microbial activity resulted in a maximum thatch degradation. From this, it might be concluded that treatments should be directed toward this mid-summer period to achieve maximum control of thatch with microbes.

Dr. Koths said that the most effective treatment to control thatch thus far is top dressing the turf with soil mixtures. Golf course superintendents sometimes spread a mixture of sterilized loam, peat and sand lightly over the greens to control thatch. "It would appear," Dr. Koths says, "that replacing these partially sterile mixtures with a compost containing thatch — collected from golf greens and fairways and lawns — would contain microbes more adept at rotting thatch."

In this continuing study, being undertaken as part of the research program in the Storrs Agricultural Experiment Station, Dr. Koths is concentrating on differences in thatch-degrading microbes found in composts prepared in various ways. From these efforts, he hopes to find a more efficient method for biological control of thatch in turf.

Chlordane Booklet Available From Velsicol Chemical Corp.

A booklet containing years of in-depth study and experience regarding chlordane insect control chemical is available from Velsicol Chemical Corporation. It's designed to give readers a more complete understanding of the critical issues concerning all pesticides. The booklet gives data and references that do not support a conclusion that its registered uses have a deleterious effect on the environment or any facet of human health. To the contrary, such uses are shown to be safe and beneficial. Booklets concerning heptachlor and endrin, two other Velsicol insecticides, will be available in the near future. To get free copies of the chlordane booklet, circle 719 on the reply card.

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North Central Weed Control Conference Report

PESTICIDES & WILDLIFE ALGAE & WATER

CHEMICAL PESTICIDES are very necessary tools man needs to manage the environment, and wildlife is not vanishing because of their use, an ecologist told scientists attending the North Central Weed Control Conference in December.

Dr. Donald A. Spencer of the National Agricultural Chemicals Association and conference keynoter said the U.S. is producing more game animals on fewer acres than at any time in the past.

While a few species have disappeared in the past 50 years, he said that disappearance of endangered species, threatened by civilization and habitat changes, has been slowed.

According to Spencer, wise use of herbicides to change plant cover can benefit both man and game animals. Herbicides can be used, for example, to create wildlife habitat by opening up intensive plant growth on rangeland and arresting the closing in of natural forest regeneration in game management areas.

"Despite the mishaps and the adjustments in dosages and methods of application that have become necessary as unwanted side effects became apparent, the overall effect of their use has been one of benefit," said Spencer. "Wildlife in general and game in particular have maintained, and in many cases increased, their populations where pesticides are one of the land management tools."

Operation of fish hatcheries and fish and shellfish culture, he continued, would be difficult, if not impossible, without herbicides and algicides, which serve as the "plow" in water resources.

Water Quality Standards by '73

Another general session speaker said water quality criteria would be developed within two years to comply with the Federal Water Pollution Control Act of 1970.

Quentin H. Pickering of the Federal Water Quality Environmental Protection Agency said the criteria would indicate the effects on health and welfare that could be expected from the presence of pollutants.

"Water quality criteria for aquatic life can best be determined on the basis of continuous-flow, chronic toxicity studies," he said. "Exposure should be for at least one generation and mortality, growth and reproduction parameters should be studied."

Knake Elected President

Some 400 persons attended this 25th weed control conference, Dec. 8-10 at Lexington, Ky. Dr. Ellery Knake, agronomy department, University of Illinois, was elected president. Second vice-president is Dr. Jim Williams Extension agronomist at Purdue University. William Meggitt, professor of soil and crop science, Michigan State University, was named second vice-president. The new editor of NCWC is Larry Mitich, Extension agronomist at North Dakota State University. M. K. McCarty, agronomist from the University of Nebraska, remains secretary-treasurer.

Next year's conference will be Dec. 7-9 in Hotel Muehlebach Kansas City, Mo.

Algae Control Results

Three speakers discussed results of recent tests on algae control methods.

Copper sulfate is an effective control material, said Robert G. Hiltibran of the Illinois Natural History Survey, but two safer forms of copper are Cutrine, a liquid formulation, and Algaecidex, a powder. Both are less toxic to fish than copper sulfate, he said. In his research report, Hiltibran cited these results:

- A mixture of equal volumes of diquat and a liquid copper sulfate solution containing 8.5% of copper as copper triethanolamine complex eliminated curlyleaf pondweed in a 5,000 sq. ft. test area. The rate of diquat cation was 0.25 ppmw, half the usual suggested rate for diquat for curlyleaf pondweed.
- Di (N, N dimethylalkylamine) salt of endothall and Mono (N, N dimethylalkylamine) salt of endothall at a rate of 0.5 ppmw (endothall content) eliminated curlyleaf pondweed.
- Two pounds of 80% WP, diuron were applied to 2.6-acre body of water containing 9 acre feet of water for the control of filamentous algae. The algae were completely eliminated and the leafy pondweed was reduced to an extent that further weed control was not necessary in 1970.
- One-half pound of 80% WP diuron, applied in July to a 0.7-acre pond with about 4.3 acre feet of water eliminated duckweed.

Walter Weber of the Indiana Farm Bureau Cooperative Association, Inc., gave a preliminary report on a 10-county algae control test in his state.

Hydrothol-47, a granular formulation, was selected because it would contact the filamentous algae during application and then the herbicide would be released as the granules settled on the bottom. The biodegradable material is relatively safe to fish and is registered with USDA for algae control, he said.

The treatment was 17.5 pounds of Di (N, N dimethylalkylamine) salt of endothall (100 pounds Hydrothol-47) per surface acre.

Except for a few fingerlings in one pond, no largemouth bass, bluegills or yellow bullhead catfish were killed, he reported.

Dennis L. Vedder of Marine Biochemists, Inc., Waukesha, Wis., using a striking example, spoke of the advantages of using Cutrine over copper sulfate for the control of planktonic algae.

Between 1958 and 1968, 254-acre Lake Delton in Wisconsin was treated with a yearly average of 1,115 lbs. of copper sulfate pentahydrate, including 284 lbs. of metallic copper, and applied at an average spraying time of 5.7 hours. For the years 1969 and 1970, Vedder said, the average treatment with Cutrine was 82 pounds, including 62.7 lbs. of metallic copper, in 2.5 hours of spraying time.

Similar results were obtained, he said, on 2,072-acre Lake Delavan.

Hyvar XL for Brush Control

Hyvar XL at the ratio of 2 gals. per 100 gals. of water is an effective basal stem application to control a broad range of tree species, reported C. B. Harris, Jr. of DuPont Company.

Applications up 16 inches on saplings from two to four inches in diameter were successful on species such as wild cherry, red maple, elm, sassafras, walnut, redbud, ash, mulberry, dogwood, willow, cottonwood, poison ivy, hickory, among others, he said.

Soil type and season did not alter effectiveness, he continued. For spraying at temperatures below 32 degrees, Harris said 6 gals. of methanol were added to the solution.

USDA Asks for Comments On Uses of Mercury

The U.S. Department of Agriculture has asked for views on the importance of uses of mercury pesticides in order to determine essential uses as distinct from other less vital uses which might be withdrawn to minimize hazard to the environment.

Although this action was initiated by USDA, evaluation of the comments received and final determination of which uses should be retained and which uses should be withdrawn will be made by the Environmental Protection Agency. Authority for registration of pesticide products under the Federal Insecticide, Fungicide, and Rodenticide Act was transferred from the Agricultural Department to the new environmental agency on Dec. 2.

Mercury use in pesticides in 1959 declined 10% from the record high of 1968. More than 986,000 pounds or slightly over 16% of the total U.S. mercury consumption was used for pesticides manufacture. Current information on levels of mercury in the environment led to the concellation by USDA of certain registered mercurial pesticide uses as seed treatment, as algaecides or slimicides, and in commercial laundries earlier this year.

Areas of particular concern include uses of mercury on ornamental shrubs, trees and turf.

Written data, views, or arguments regarding the proposed cancellation should be submitted in triplicate to: Director, Pesticides Regulation Division, Environmental Protection Agency, Washington, D.C. 20250.

All submissions must be made no later than 60 days after publication in the Federal Register (Dec. 3). All written submissions will be made available for public inspection.

Dairy Mulch for Turf Works Like Hair Restorer

You can't grow grass on that piece of hard ground out back? Call your nearest dairyman.

This may not be as far-fetched as it sounds, say Ventura County, California farm advisers Richard Baldwin and Ervin Bramhall.

Turf expert Baldwin and dairy expert Bramhall have found that washed dairy manure worked like a "miracle hair restorer" in at least one instance.

Groundkeepers at Olivas Golf Course, Ventura, were having a lot of trouble with bald spots caused by excess salinity. Almost as soon as they spread grass seed, the seedlings would curl up and die.

Bramhall and Baldwin decided to try washed-and-dried dairy manure as a mulch. They suspected that salt was kililng the grass, Since fluffy manure mulch has had most of the salts washed out of it, they figured it might help the grass grow.

They seeded the saltiest spots they could find. Then the arranged for several truckloads of dairy mulch to be delivered from the Chase Brothers dairy at Oxnard.

They spread the mulch at three rates of thickness: 3/16, 3/8, and 3/4 of an inch. They left one seeded area bare of mulch.

Within nine days the mulched grass had sprung up, vigorous and green. Initially the best growth was where the mulch was 3/8-inch thick. Later the thickest mulch treatment looked as good or better.

"Apparently," said farm adviser Baldwin, "the mulch held moisture at the surface of the ground. This kept whatever salt rose to the surface from being concentrated through evaporation. The salt, in other words, remained in a dilute state. It didn't become strong enough to kill the germinating grass.

"At least, that is our theory of what happened. It could also be a result of keeping the grass seed from drying out."

No Merger, Says Nunes, New Company Instead

An article in the November issue of WEEDS TREES and TURF was misleading, writes John F. Nunes, Jr., of Nunes Turfgrass Nursery, Inc. There was no merger, he said, of Nunes Turfgrass Nurseries, Inc. and Jacobsen Turfgrass Nurseries. Instead, "a new corporation was formed to service the southern portion of California," he explained. The name of the new firm is Nunes-Jacobsen Sod, Inc., with offices at Tehachapi. "Nunes Turfgrass Nurseries, Inc., is still in existence, and is no way involved with the new organization," he added. "And Mr. Jacobsen is no way involved with Nunes Turfgrass Nurseries, Inc."

USDA Announces Measures to Prevent Parathion Mishaps

The U.S. Department of Agriculture has announced new measures designed to prevent accidential human poisonings from the highly toxic pesticide parathion.

Measures include a container label substantially altered to emphasize safety factors, special tags on all parathion containers to warn customers of the dangers involved in the use of the chemical, recording of parathion sales by dealers, eliminating glass parathion containers, and joint action by USDA and the states to avoid parathion injuries.

These steps are being taken with the cooperation of the pesticide industry and as part of the nationwide pesticide-use management program being developed jointly by USDA and state agencies.

Dr. Ned D. Bayley, Director of Science and Education, said the new parathion label will feature a large, bold, red stop-sign with skull-and-crossbones to indicate the high toxicity of the product. Small silhouettes—an innovation in safety for pesticide labels—will appear on the label to graphically illustrate that the chemical can be lethal if consumed, inhaled, or spilled on the skin.

Manufacturers will ask dealers to make sure that every purchaser of the pesticide knows the dangers involved in its use. Dealers are to keep records of who buys the material and to have the purchaser sign a card indicating he is aware of the safety requirements.

The completed cards will be forwarded by the dealer to a designated state official who will also keep a record of such purchases.

Another step to combat accidents will be the requirement that all parathion labels recommend the posting of fields treated with the chemical for crop protection. The placards for posting the treated fields will be made available by pesticide manufacturers to dealers for free distribution to parathion purchasers.

Parathion is the first pesticide included in the memorandum of understanding signed by the U.S. Department of Agriculture and state regulatory agencies to avoid incidents of poisoning with highly toxic pesticides. In addition to the specific measures outlined above, the memorandum as it relates to parathion recommends that:

—Physicians through appropriate associations be made aware of areas in their state where parathion is likely to be used. Efforts will be made to acquaint doctors with tests for parathion poisoning and to encourage them to have the appropriate tests made.

—The state cooperate with pesticide manufacturers, dealers, and others to develop an educational program to acquaint the concerned publc with problems associated with the use of this chemical.

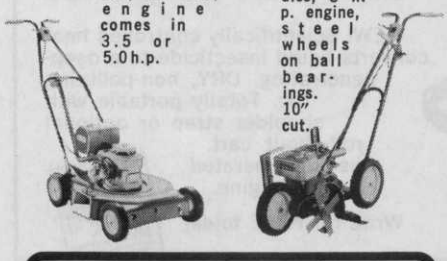
THE NEW LOOK IN HEAVY DUTY COMMERCIAL MOWERS

GOODALL FOR THE '70'S

GOODALL SELF-PROPELLED
Easy handling, professional design, finger tip power steering and turning, comes in 21", 28", 36" and big 52" cuts ups to 8 h.p. engine. One year warranty on entire unit.

GOODALL PUSH MOWER
Rugged, unbreakable steel handles, available in 19", 20", 22" cuts, engine comes in 3.5 or 5.0 h.p.

GOODALL EDGER-TRIMMER
Unbreakable steel handles, 3 h.p. engine, steel wheels on ball bearings. 10" cut.



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For information, write GOODALL DIVISION
4303 Poplar Level Road, Louisville, Kentucky 40213, Phone 502/459-3810

Shaw Heads Florida Spraymen's Association

Joseph C. Shaw of Shaw Nursery and Landscape Co., South Miami, is the new president of the Horticultural Spraymen's Association of Florida. Other officers include three regional vice-presidents: Earl Walderman, Port Orange; Craig Anderson, Fort Lauderdale; and Walter Ferguson of Winter Haven. Directors at large are Joe Trapp, Cape Coral; John Abbott, Miami; Larry Hatcher, Lake Worth; and Larry Nipp, Fort Lauderdale.

Illinois Study Tells How To Improve Pesticide Labels

A two-year study on the adequacy of pesticide labels, sponsored by the U.S. Department of Agriculture, reveals how the comprehension and legibility of these labels can be improved.

The study, conducted by communications scientists of the University of Illinois, Urbana, under contract to USDA's Agricultural Research Service, was designed to measure the adequacy of registered pesticide labels and establish guidelines for making these labels more effective in communicating use and precautionary information to the user.

Nearly 350 pesticide labels were analyzed for factors affecting legibility and comprehensibility.

The study pointed out that while today's pesticide labels are far from ideal, potential as well as actual pesticide users generally understand most label terms in common use. However, the reading-ease score of the labels (57.03—fairly difficult to read) could be improved since only those with at least 10 years of formal education are able to comprehend the average pesticide label.

Suggestions for improving pesticide labels included: improving their legibility; printing precautionary information and directions for use in 11-point type, regardless of label size; using color combinations ranging from black-on-yellow to black-on-white; testing label messages for reading ease; and including information about proper pesticide storage and disposal of empty containers.

The Illinois scientists recommended retaining "POISON-DANGER" and the skull and crossbones warnings printed in red for highly toxic pesticides.

Pesticide labels currently in use and new labels being submitted are now being checked for inadequacies pointed out by the Illinois study.

WATCH FOR SPECIAL RENEWAL CARD IN FEBRUARY

A nine-acre bag of fertilizer and a 30-ft. spreader were near shop stoppers for Michigan sod growers who participated recently in a "fly-in seminar" at O. M. Scotts & Sons, Maryville, Ohio. The one-day, pow-wow seminar is new for Scotts. While growers and golf course superintendents and landscape architects had been coming to seminars, this was the first one-day, fly-in affair. The plane picked up growers at Lansing and redeposited them there at a decent hour in the evening after the men had experienced a day packed with facts, questions and answers, color slides and tours, and a dinner at Timber Trails Country Club near Marysville. The 10 growers from seven communities were: Jack and Ted Bosgraaf of Blue Grass Sod Farm, Inc., Hudsonville; Lyle Young of Halmich Sod Farm, Lansing; Russ Craft of Halmich Sod Farm, Brown City; Ed Vidosh and Allen Awalt of Green Acres Turf Farm, Mason; Jack Bower of Jack Bower Sod Farm, Bath; Leo DeBuck of DeBuck Sod Farm, Inc., Davison; Wallace Huggett of Huggett Sod Farm, Marlette; and George Beck, Beck Sod Farm, Palms.

At left, Dale Kern (center, hand on chin) of Seed Technology, Inc., shows methods of analyzing seed samples to determine content. In addition to seeing Scotts fertilizer, seed and research facilities, the growers toured some 800 acres of grass plots containing more than 1,500 selections of grass from 44 countries.

Keel Re-Elected President Of NW Turfgrass Assn.

An estimated 300 persons attended the 24th annual Northwest Turfgrass Association conference recently in Salishan.

Tom Keel, director of Douglas County Park Department, was re-elected president. Other officers are: Vice-president — Dick Schmidt of Renton, Wash.; executive secretary —Dr. Roy Goss, of Puyallup, Wash.; and treasurer—Dick Haskell of Seattle, Wash. Directors are Dick Mitchell of Vancouver, B.C.; John Harrison of Hayden Lake, Idaho; John Zoller of Eugene, Ore.; Dick Malpass of Portland, Ore.; Art Elliott of Seattle; Al Blair of Seattle; and Ron Proctor of Federal Way, Wash.

Conference delegates voted a $2,000 grant to Puyallup Research Center.

The Association draws membership from Oregon, Washington, Idaho, Montana, and British Columbia. The 25th conference will be Sept. 22-24 in Yakima, Wash.

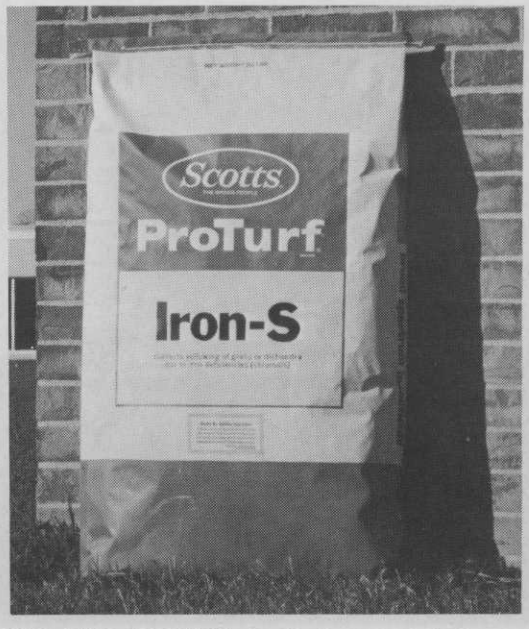
If you care about tree care,

membership in the International Shade Tree Conference won't cost; it will pay. Write Box 71, Urbana, Ill. 61801 for information and application form.

INTERNATIONAL SHADE TREE CONFERENCE 1924

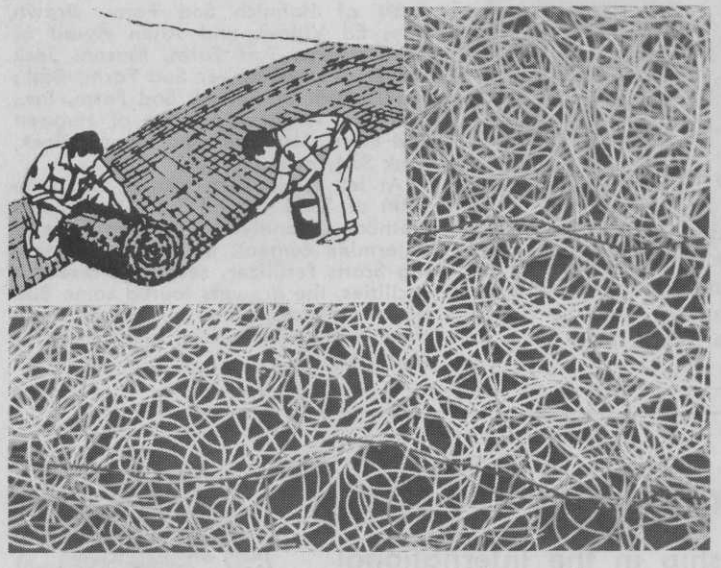
LAWNMOTORING CATALOG, Massey-Ferguson, Inc., Des Moines, Ia.

The above catalog describes the MF line of 7 to 112 hp tractors and accessories available, including snow blades, snow blowers, sprayers, sweepers, rollers, aerators, three to five gang reel mowers, diggers, rotary tillers, etc. The MF 5 and MF 6 riding mowers feature rocking front axles and differential-equipped rear axles. Both machines have "Feather Lift" mower height adjustment. The MF 5 has two speeds forward and one reverse and is powered by a 5 hp Tecumseh engine, cutting a 26-inch swath. Heights range from 1½ to 3¾ inches. MF 6 has a 6 hp Tecumseh engine and cuts a 32-inch swath. Its transmission provides three speeds forward and one reverse. For details, circle (701) on the reply card.



NEW TURF PRODUCTS, O. M. Scott & Sons Co., Marysville, Ohio

New additions to the Scotts ProTurf line are ProTurf Starter Fertilizer and ProTurf Iron-S. The products are to be sold to golf courses, industrial and professional users. ProTurf Starter Fertilizer is said to enhance seedling growth and root establishment. It is dry-applied, granular, odorless and non-burning, composed of homogenous dust-free particles. One 44-lb. bag treats 11,000 sq. ft. ProTurf Iron-S helps turfgrass and dichondra with iron chlorosis to quickly regain their normal color. It also is a dry-applied, ready-to-use product, composed of homogenous dust-free particles. One 30½-lb. bag treats one-quarter acre. For more details, circle (702) on the reply card.



SOIL RETENTION BLANKET, AMXCO, Inc., Arlington, Tex.

Constructed of interlocking, curled, barbed aspen fibers, the soil retention blanket provides low-cost erosion control for steep slopes, shoulders, median strips, embankments, drainage ditches, ski slopes, waterways, dam sites, levees, and landscape improvements generally. Especially suited for steep grades and areas exposed to heavy water or strong winds. It stays put long enough to get good growth established, then decomposes gradually. For more details, circle (705) on the reply card.

CORE SHREDDER ATTACHMENT, Skagg's Turf Equipment, Canfield, Ohio

Eules Skaggs, left, and Harold Skaggs are introducing this spring a core shredder attachment that shreds cores (rignt half of bottom picture) as a golf green is aerated. It's a one man operation, says Harold, who is a golf superintendent. The shredded cores become an ideal top dressing. If you have greens built to USGA specification, you need this attachment to avoid changing your soil composition, the Skaggs say. For more information, circle (706) on the reply card.

COMMERCIAL TRIMMER EDGER, Goodall Division, Louisville, Ky.

Model 18G-35THD is especially designed for professional trimming and edging. Easy to handle, the front caster wheel swivels, permitting easy, level turning when trimming around trees, fences, walls and shrubs. Front caster wheel is locked in the straight forward position for tilting when edging along sidewalks, driveways and curbs. Edgerguards prevent marking or chipping from blade and direct grass away from objects you want to trim or edge. Heavy-gauge steel handles and steel wheels are set in and behind edgerguards. Cutting height adjustable from 1⅜ to 2⅝ inches. The line includes 10, 12 and 18 inch trimmers and edgers. For details, circle (703) on reply card.

MODEL 550 SERIES
Pop-up Spray Head
Eleven Interchangeable Heads

MODEL 620 SERIES
Pop-up Gear Driven
Rotary Sprinkler

MODEL 500 SERIES
Adjustable Shrub Head

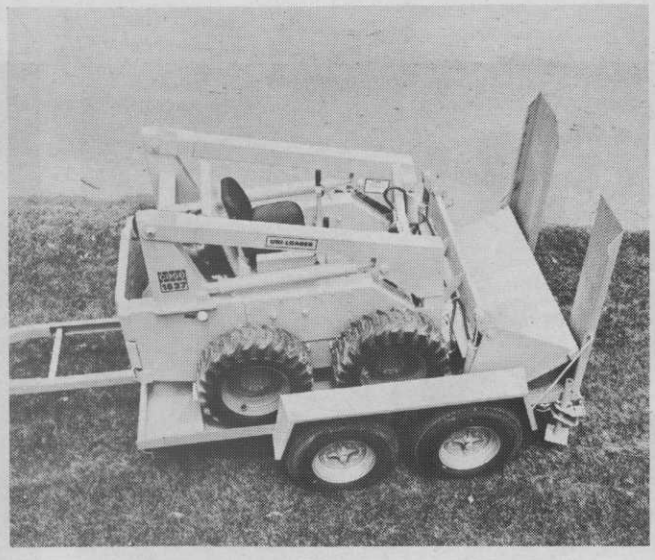
MODEL 511 SERIES
Adjustable Stream Bubbler

NEW SPRINKLER HEADS, Toro Manufacturing Corporation, Moist O'Matic Division, Riverside, Calif.

New for 1971: The 620 series pop-up sprinkler head has a pop-up stroke of 2⅜ inches. Spring-loaded sealed riser insures positive retraction. Filter can be serviced in the field. The 620 head is designed for large residential, commercial and institutional systems. Available in four models: ¼-circle, ½-circle, ¾-circle and full-circle. Full-circle covers area 90 feet in diameter. The all new 550 fixed-spray pop-up can cover up to 30 feet and can be purchased with 11 nozzles to alter the arc of the spray. The adjustable shrub head comes in seven models, from ¼ to a full arc and from a radius of four to 12 feet feet. The adjustable stream bubbler is designed for use in flowerbeds, ground cover and shrubbery for which ground-level watering is beneficial. It does not spray. It has an adjustable flow or stream. The stream bubbler is available in three models, for ¼, ½ or full arc. It will cover up to nine feet in diameter. For more details, circle (704) on the reply card.

IMPROVED ECONOMY TRACTOR, Engineering Products Co., Waukesha, Wis.

New operating ease in 1971 models is offered by a new 1,000 lb. capacity hydraulic lift system available on all Economy tractor "Power King" and "Jim Dandy" models. Fingertip control begins with pressure supplied by a separate, heavy-duty gear pump which delivers 1.8 gpm at 3600 rpm. A special four-position valve provides control to lift, power, hold, or "float" the bulldozer, mower, plow, or other tools. For details, circle (707) on the reply card.



UNI-LOADER TRAILER, J I Case Company, Racine, Wis.

The Uni-Loader trailer has a capacity of 7,500 lbs., and is designed for rugged service and easy towing at highway speeds to 50 mph. An extendable tongue provides adjustable overall lengths of 14'6", 15'6" and 16'6" for proper weight distribution. Six ply tires. 8,000-lb. hitch and surge brake assembly. Hydraulic brakes available. Loading ramps are "ZEE" type tread plate 15" wide and 56" long. For more details, circle (708) on the reply card.

SPRINKLER HEAD TRIMMER,
W. J. Seidler Co., Los Angeles, Calif.

"Mr. Trimmer" is a newly introduced lawn and garden tool designed to trim grass around sprinkler heads and to cut out crabgrass and weeds that travel under lawns. It also is an efficient digger for planting seedlings and bulbs. Made of 20-gauge steel, with baked enamel finish, Mr. Trimmer works with an easy twist-and-turn motion. Specially designed cutting edges do a clean-cut job. For more details, circle (709) on the reply card.

BURNER SPRAYER, Aeroil Products Co., Inc., South Hackensack, N.J.

Aeroil's new combination burner and sprayer is especially designed for golf course maintenance. The unit is available with either a four or five gallon fuel tank. Model #99 burner uses kerosene. The torch is equipped with a shut-off valve and pressure gauge. A sprayer attachment is available for insecticides. Model #99 is especially applicable for burning weeds around the golf course. For more details, circle (710) on the reply card.

IMPROVED SPREADER,
Vandermolen Corp., Livingston, N.J.

The exclusive "Dreycal" epoxy plastic finish is now available on a lower priced Diadem spreader, the new Diadem 290. According to the manufacturer, the "Dreycal" finish is made of a similar epoxy resin as used on the heat shield of the Apollo space capsule. The "Dreycal" finish provides long-range protection from rust and corrosion and allows for easy cleaning. The Diadem 290 has a capacity of 11 cubic feet (9 bushels) or roughly 770 lbs. of fertilizer. The spinner spreads a 50-ft. swath. For more details, circle (711) on the reply card.

COMPACT LOADER, International Harvester Co., Chicago, Ill.

Highly versatile for all types of landscaping operations is this new IH 3200 Compact Loader to be exhibited at the 9th annual meeting of the Associated Landscape Contractors of America, Jan. 18-22, New Orleans. The 3200 with hydrostatic drive has forward and reverse speeds anywhere from 0 to 8 mph. This ¾-ton, 6.8 to 20 cu. ft. capacity loader pivots in its own length, works under 6-ft. clearance, passes through 4-ft. wide openings. For more details, circle (715) on the reply card.

PALOMINO MOWER, Roof Manufacturing Co., Pontiac, Ill.

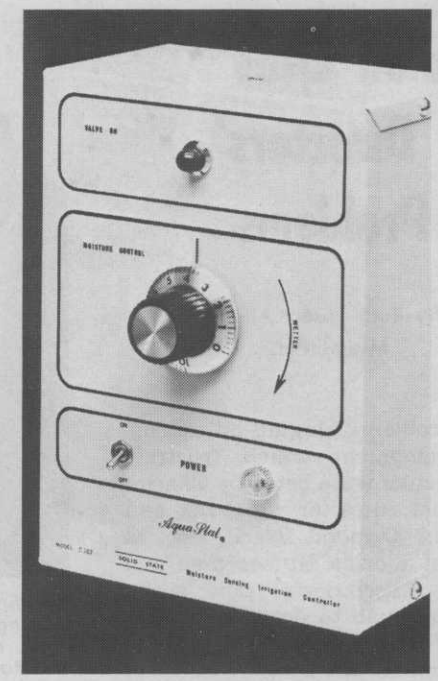
The Roof Palomino carries four men and their equipment at speeds up to 14 mph. Three 20-inch mowing blades mow large areas fast without scalping. Two PTO stations for driving sweeper, pump, sprayer. Big low-pressure flotation-type tires give the machine traction under adverse conditions. All-weather cab provides operator protection day and night, year around. The 18 hp, hydrostatic transmission allows speeds from a creep to a crawl to a run without shifting. For more details, circle (716) on the reply card.

RED HEAD DIGGER, The Savage Co.., Dodge City, Kans.

This one-man hole digger operates from any car, truck or tractor 12-volt system. Battery clamps with 20-ft. flexible leads make jobs easy to reach. It's powered by a 2 hp Prestolite motor. Augers come in six sizes, from two to seven inches in diameter. Standard length auger digs holes to 32 inches, and 44 inches using the 12-inch optional extension. Other optional attachments are an adjustable tension slip clutch, Jacobs geared three-jaw ½-inch drill chuck, and a gasoline engine ¾-inch chuck starter. For more details, circle (712) on the reply card.

IMPROVED POWER RAKE, F. D. Kees Mfg., Co., Beatrice, Neb.

Engineering features designed to minimize damage to lawns when using mechanical raking or thatching units have been incorporated into both 1971 Powerake models. A Kees spokesman explained that both 4 hp and 5 hp Powerake units utilize 28 hardened steel plate, self-cleaning fingers set on four satellite shafts along with 52 tough Implex spacers. An additional feature of the 1971 models is that the entire shaft may be turned end-to-end to equalize wear. The individual satellites may be easily removed for quick change of worn fingers. For more details, circle (713) on the reply card.



MOISTURE SENSING IRRIGATION CONTROLLER, AgTRONICS Mfg. Co., Barstow, Calif.

The AQUA-STAT is an entire family of controllers, ranging in size from a single station operation to a 26-station controller. Working with an irrigation system, it becomes a "servo-mechanism," capable of maintaining automatically the exact degree and range of moisture for optimum growing conditions of the particular plant. It monitors the soil moisture at a number of points, by means of remote buried sensors. These sensors continually feed back information to the controller. Signals are then generated to operate the proper control valves automatically. For details, circle (714) on the reply card.

THE OUTLAW, Applied Research and Development Co., Houston, Tex.

This rugged terrain vehicle features an articulating/oscillating center section (45° turn, 20° oscillation). High torque industrial engine (Ford gasoline or Perkins diesel). Turning radius for inside tires is 6 ft.; outside tires, 13 ft. Width is 86"; Length, 179"; height to top of canopy, 96". Ground clearance is 13" at axle, 19" at pivot point. For more details, circle (717) on the reply card.

FOAMSPRAY, The R. L. Wilson Co., Houston, Tex.

Wilsco's foaming agent enables more efficient and effective application of herbicides. FoamSpray reduces the amount of water needed; increases the herbicide action on the plant surface; provides visual evidence of spray coverage. No special equipment needed other than foam generator attachment for spray nozzle. For more details, circle (718) on the reply card.

Floridian Cites Park Directors' Five Problems

By Ruth Stuart Allen
Miami, Fla.

Five problems hinging on upkeep and development which frustrate park directors were listed by Charles H. Swisher, director of parks and Recreation, Ormond Beach, Fla., at the recent Florida Nurserymen and Growers Association's trade show. All of them had to do with the inevitable "second person" in government administration.

First, Swisher pointed to the purchasing of equipment. A park director, he said, best knows the type of machines he needs to perform certain jobs, light or heavy.

Enters, then, the purchasing agent, "Who knows nothing about our problems. Chances are he will buy the biggest and cheapest pieces without consulting the director, feeling that he is saving the taxpayers' money." He stressed that the people responsible for the end result should help make such decisions.

2. The privilege and importance of passing on job applicants. Sometimes these people, hired without the director's approval, work out, but as a rule it is time wasted for everybody when personnel directors who "have no knowledge of park maintenance, etc., arbitrarily employ an applicant without consulting the department head under whom the new employee will work. "We must have the final say on any employee hired, to be sure he understands the work he will be doing."

3. Each administrator should have the privilege of okaying the pay scale based on the man's ability and type of position he will be filling.

It is folly, Swisher said, "to stereotype our employees with others within the department, or with those in other departments. Each man should be paid on the basis of his work and not that which someone else is making."

4. Many small departments must depend upon a central garage for maintenance repairs. "In my case, a lot of man-hours are lost because except during the grass season, my department does not have priority, and my equipment does not receive the attention I feel is necessary. This is a park system's biggest key to survival ... the condition of its equipment."

Swisher feels that preventative maintenance is important, then, when a piece of machinery does require an overhaul, it is not out of service too long.

5. The all-important budget: Park administrators should have a voice in how much money they need, where and how, and for what purpose it should be spent. "Our budget planning should not be left to others. But if this is not possible, be sure you 'red star' the items you need most."

Many park jobs are started and not finished he said, because of insufficient equipment, manpower and funds to follow through.

Refinement of horticultural standards, especially as applied to highway landscaping, was the topic of a recent meeting in Washington between John Ryan, right, chief landscape architect of the New York Department of Transportation, and Ray Brush, secretary of the American Association of Nurserymen. Ryan, a new member of the AAN Horticultural Standards Committee, was appointed when AAN underwent a reorganization of a number of its working committees to include non-nursery industry members. Of major concern to highway landscape architects is improvement of standards for small flowering trees used along the nation's highways. The AAN Horticultural Standards Committee is responsible for establishing stock standards and specifications. The committee is charged with keeping U.S.A. Standard for Nursery Stock current with industry needs and approved practices.

USDA Asked to Speed Up Gypsy Moth Research

Woodland and suburban environments in many parts of the Northeast may be destroyed unless gypsy moth research is vastly increased, the National Gypsy Moth Advisory Council has told legislators and officials of the U.S. Department of Agriculture.

Council Chairman William H. Gillespie asked that efforts of USDA's Agricultural Research Service and Forest Service to develop new and better ways of controlling the gypsy moth be increased by about 22% in Fiscal Year 1970 and by nearly 45% during each of the following four years. The request is based on a "program for integrated control of the gypsy moth" developed jointly by USDA and the infested states. The program calls for intensified research into the combined use of nonpersistent chemicals and such biological controls as sex attractants, insect diseases, and increased emphasis on parasites and predators including the introduction of new ones from foreign countries.

In the caterpillar stage the gypsy moth eats leaves. Repeated defoliations will kill trees, thereby polluting, and even destroying, forest environments. During 1970, gypsy moths defoliated nearly 800,000 acres of woodlands in eight Northeastern states, thereby tripling the acreage defoliated in 1969 and causing six times more damage than in 1968.

Caterpillar hordes are currently spreading outward into new states. At present, Connecticut, Massachusetts, Rhode Island, New Jersey, Maine, New York, New Hampshire, Vermont, and Pennsylvania are infested. The trapping of numerous

Ohio's Worst Nursery Pests

Here's the ranking of insects and disease pests in Ohio nurseries in 1970 as compiled by the Ohio Department of Agriculture, Division of Plant Industry.

Rank 1969	Rank 1970	Pest
5	1	Spruce mite
4	2	Cooley gall aphiid
3	3	Fletcher scale
1	4	Taxus mealybug
2	5	Eastern spruce gall aphid
9	6	Aphids (misc. hosts)
6	7	Birch leaf miner
12	8	Bagworm
7	9	Black vine weevil
13	10	Spruce Needle Mixer

Rank 1968	Rank 1969	Disease
1	1	Scab (Flowering Crabs
2	2	Crown Gall (Woody Hosts)
17	3	Mildew (Perennials)
10	4	Leaf Spots (Perennials)
3	5	Foliar nematodes (Mums)
11	6	Anthracnose (Shade trees)
....	7	Apple scab (Malus)
4	8	Juniper blight (Juniper)
7	9	Cedar apple & Hawthorn rust
8	10	Verticillium wilt (Woody hosts)

male moths in Delaware, Maryland, and Virginia this summer indicates that the pest is becoming established in these states.

ARS officials attending the meeting reported that chemical controls will be used for regulatory purposes on 25,000 to 30,000 acres in the Northeast next summer. New York, Massachusetts, New Jersey, and Pennsylvania plan control work on about 250,000 additional acres.

Gillespie pointed out that chemical controls are mainly restricted to use on heavily infested parks, camp grounds, and other areas—such as valuable timberland—where there is a strong likelihood of gypsy moths attaching egg masses to trailers or other vehicles and hitchhiking into uninfested areas. The insecticide used as carbaryl—a nonpersistent compound low in toxicity to humans and to birds, fish, and other wildlife.

The Advisory Council consists of state agricultural officials, conservationists, foresters, farmers, timber industry officials, and others concerned with protecting the nation's timber resources.

Which? Algicide or Algistat To Clear Up Foul Water

Slimy swimming pools, clogged industrial water filters, foul drinking water — algae is usually to blame.

Long-term environmental control may be the ideal solution to algae problems. But a University of Wisconsin water quality specialist feels that immediate chemical treatment is necessary when nuisance algae threaten public water quality and hygiene.

Speaking at the First National Biological Congress, George Fitzgerald contended that the first step in chemical control is to decide whether to completely kill the algae with an algicide or simply to keep them at a low level with an algistat.

"This decision," said Fitzgerald, "depends on the kind of algae. Some, even in very small amounts, cause foul odors, while others are only offensive in extremely large numbers."

Hardness or alkalinity of the water supply is another factor to consider when selecting a control chemical, according to Fitzgerald. For example, copper sulfate, unless properly treated, combines with some of the chemicals in hard water and drops out of solution. This is also a problem with some compounds currently used to control algae in swimming pools, he added.

Often the algae themselves may be releasing compounds into the water which inactivate the algicides, Fitzgerald explained.

Some algae are enclosed in a sheath which protects them from the algicide. Others, growing in a thick mat formation, may be killed at the surface but will escape the algicide at the center.

Scientists are currently investigating new ways to make algicides more effective. Fitzgerald suggested applying different algicides in a predetermined sequence.

Another possibility is the use of synergists, chemicals which are not in themselves toxic but which increase the toxicity of algicides.

"Probably the most effective control of algae problems in swimming pools and industrial cooling towers is preventive maintenance," Fitzgerald said.

"If the proper concentration of chlorine is well circulated through the pool, algae will not be a problem. Likewise, regular use of an algicide on water cooling towers will prevent a build-up of the problem algae which clog pipes and cause dangerous overflows."

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trimmings

OUR CHRISTMAS TREE this year carried a tag with this information on it: "For many years, this tree has beautified the land; cleansed the air; provided you with oxygen; and protected your water supply. Its removal has freed other trees to make a similar ecological contribution. After it has added joy to your Christmas, let the tree continue to benefit the environment. Place it on your lawn as a bird shelter and feeder, or remove its branches for plant mulch. The remaining trunk will provide rustic wood of many uses." We call that an outstanding sales promotion and public relations message from Deeks Tree Farm, Nova, Ohio.

* * *

THOMAS JEFFERSON and GEORGE WASHINGTON may be squaring off at each other, where ever they are. Grounds renovation of the Jefferson Memorial hit a pest snag recently. Forty-five truckloads of topsoil dumped on the grounds were infested with white fringed beetles. The soil came from a quarantined field in northern Virginia once owned by George Washington.

* * *

A NECTARINE TREE from the Reedley Nursery, Inc., of Reedley, Calif., has the distinction of being awarded the 3,000th plant patent by the U.S. Department of Commerce. The patent was issued to Frederic W. Anderson.

* * *

SOME 600,000 ACRES of Hawaii's unique koa and ohia trees are menaced by an unknown insect or disease. "In some places the trees are dying so quickly the leaves didn't have time to fall," reports forester Robert E. Nelson, director of the Institute of Pacific Islands Forestry. The ohia tree is essential for watershed and the koa tree is highly prized for its black mahogany-like wood, often carved into bowls and statues.

* * *

NEW JERSEY'S State Agriculture Department is predicting the loss of one million oak trees in 1971 from damage by gypsy moths.

* * *

ALLIED BIOLOGICAL CONTROL Corporation has issued an attractive folder and pin demonstrating its support of efforts to reduce pollution. The lapel pin is the green and white ecology flag. The Greek letter, Theta, warning of death, symbolizes the threat to earth and its atmosphere. Green stripes are for unspoiled land; white for pure air.

The front of the folder states: "Once the air was clean, the water clear. We could enjoy the aroma of the earth, we could walk the land. It is incredible what we have done to America in 200 years. Too much of it is now noisy, cluttered ugly and dirty. Pollution won't stop unless each of us makes a commitment to stop the environmental destruction going on all around us. Those of us who care, can wear this symbol as our commitment and pledge to act." Allied Biological Control is an aquatic and industrial weed control firm headquartered at Wellesly Hills, Mass.

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